EPA Region 5 Records Ctr.
241682

Contract No. 68-01-7367

000056

APR 6 1988
RECEIVED

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

TECHNICAL ASSISTANCE TEAM

FOR

SUMMIT EQUIPMENT AND SUPPLIES

AKRON, OHIO

Region V

ROY F. WESTON, INC.
Spill Prevention & Emergency Response Division
In Association with ICF Technology Inc., C.C. Johnson & Malhotra, P.C.,
Resource Applications, Inc., Geo/Resource Consultants, Inc., and
Environmental Toxicology International, Inc.

WESTON
DESIGNERS CONSULTANTS

EXTENT OF CONTAMINATION

FOR

SUMMIT EQUIPMENT AND SUPPLIES

AKRON, OHIO

Prepared For:

U. S. Environmental Protection Agency
Region V
230 South Dearborn Street
Chicago, Illinois

CONTRACT NO. 68-01-7367

TAT-05-N-00068

TDD# 5-8703-15

Prepared By:

WESTON-SPER
Technical Assistance Team
Region V

April 1988

TABLE OF CONTENTS

PAGE

LIST OF FIGURES.....iii

LIST OF TABLES.....iv

1.0 INTRODUCTION.....1

2.0 SAMPLE LOCATIONS.....6

3.0 SAMPLING METHODS.....30

4.0 ANALYTICAL RESULTS.....33

5.0 RECOMMENDATIONS.....58

BIBLIOGRAPHY.....60

ATTACHMENT A - 61

ATTACHMENT B - 62

ATTACHMENT C - 63

ATTACHMENT D - 64

ATTACHMENT E - 65

ATTACHMENT F - 66

LIST OF FIGURES

PAGE

1. LOCATION MAP.....2
2. SITE LOCATION MAP.....3
3. SITE MAP.....4
4. CASTLE APARTMENTS FIELD SAMPLING MAP.....11
4A. CASTLE APARTMENTS FIELD TEST PITS & SAMPLE EXCAVATIONS....12
5. LAKE NESMITH BEACH SAMPLE LOCATIONS.....13
6. LAKE NESMITH SHALLOW SEDIMENT SAMPLE LOCATIONS.....16
7. LAKE NESMITH DEEP SEDIMENT SAMPLE LOCATIONS.....17
8. LAKE NESMITH SURFACE WATER.....18
9. AIR SAMPLING LOCATIONS.....19
10. ON-SITE PCB SAMPLE LOCATIONS.....21
11. ON-SITE TEST PIT LOCATIONS.....22
12. PRIORITY POLLUTANT METALS SOIL SAMPLE LOCATIONS.....24
13. DIOXIN/FURAN SAMPLE LOCATIONS.....25
14. WELL LOCATION MAP.....26
15. SWIPE SAMPLE LOCATIONS.....29

LIST OF TABLES

PAGE

1. SAMPLE MATRICES AND PARAMETERS.....7
2. MONITOR WELL WATER TABLE ELEVATIONS.....27
3. SUPPORT AREA PCB SAMPLE RESULTS.....35
4. OFF-SITE TEST PIT ANALYSIS FOR PCBs.....37
5. LAKE NESMITH BEACH PCB SAMPLE RESULTS.....38
6. PCB AIR MONITORING RESULTS, MAY 1987.....41
7. ON-SITE SURFACE SOIL PCB SAMPLE RESULTS.....43
8. ON-SITE TEST PIT ANALYSIS FOR PCBs.....48
9. SOIL BORING ANALYSIS FOR PCBs.....49
10. PRIORITY POLLUTANT METALS (TOTAL) SOIL SAMPLE RESULTS.....50
11. 2,3,7,8 DIOXIN/FURAN ANALYSIS RESULTS.....53
12. DIOXIN/FURAN ANALYTICAL RESULTS.....54
13. GROUND WATER.....55
14. SWIPE ANALYSIS ON METAL (100 cm^2) FOR PCBs.....57

1.0 INTRODUCTION

1.1 Site Location and Description

Summit Equipment and Supplies (SES) is located at 875 Ivor Avenue, Akron, Ohio, 1/2 mile south of the I-77 & I-277 interchange (Figures 1 and 2). The 6-acre site is bordered by the Akron-Barberton Beltway Railroad tracks to the north; a marsh to the east; a residential area on Ivor Avenue, to the south; and, a light industrial area to the west (Figure 3). SES's location is hydrologically up-gradient from a marsh and Lake Nesmith, a local recreational area.

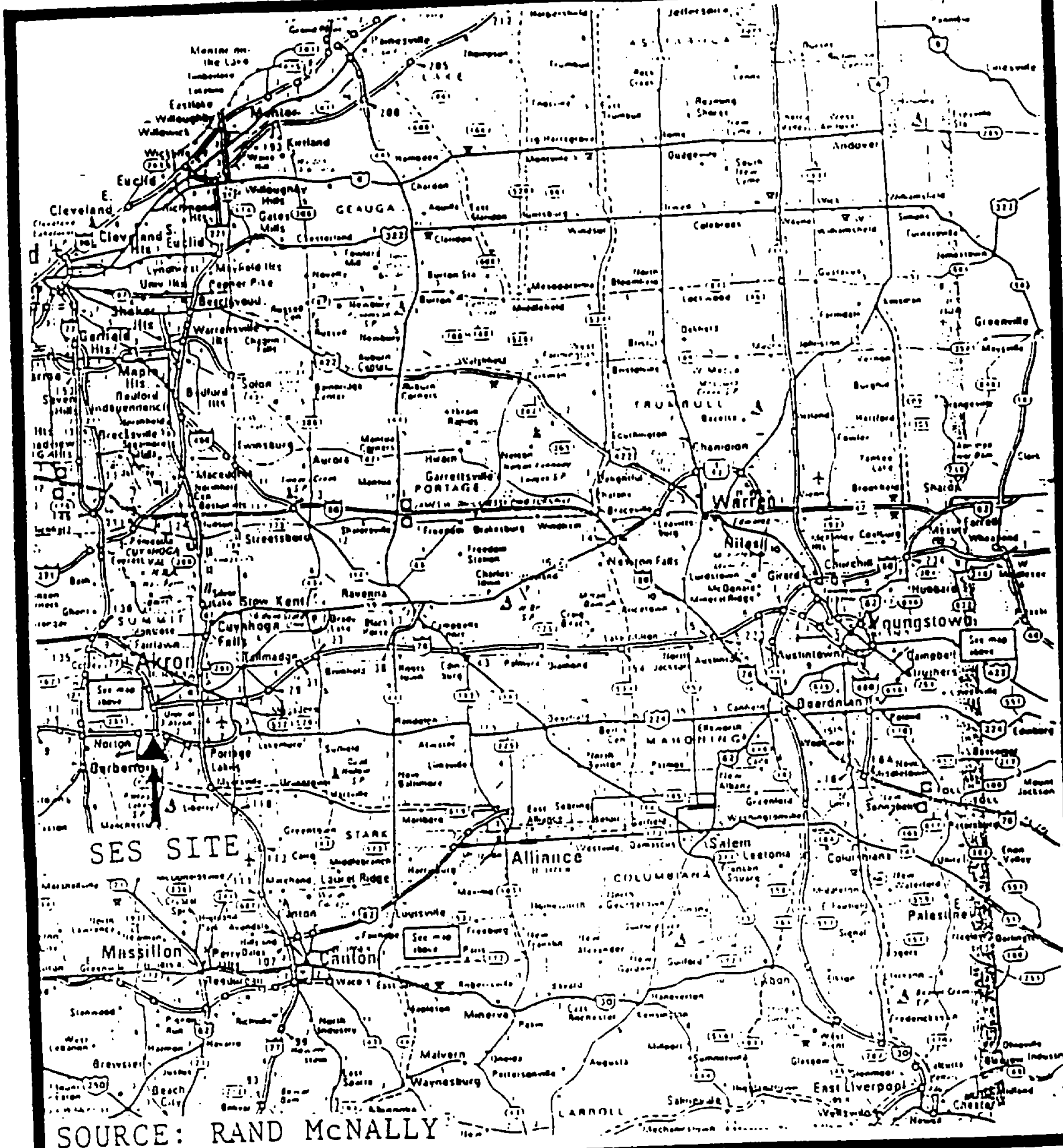
SES is an operating scrap metal processing facility. The site is covered over most of its surface with continuous piles of scrap and debris, some as high as 20 to 30 ft. The piles were not observed to be sorted or segregated in any particular order. Rather, they are aggregate heaps of sheet metal, structural steel, wire, tires, electrical equipment, batteries, and other miscellaneous debris. Access is limited by lack of access roads.

The site overlays a portion of the Akron River buried valley, a prolific ground water producer. The valley is filled in places to depths greater than 300 ft, with interlensing layers of coarse to fine alluvium, silts, clays and tills. Immediately east of the site is a peat bog bordering Lake Nesmith. Lake Nesmith empties into the Ohio Canal, which in turn leads to the Tuscarawas River, forming the headwaters of the Portage Lakes, an Ohio State Park. The site is located on a sand ridge; beneath this, the sand coarsens to include gravels, with a thin gray silt layer found at depths of 10 to 20 ft.

The subsurface geology, as verified by the monitoring wells, consists of interbedded sands, gravels and silts. The water table indicated from these wells is 7 to 16 ft below grade, with ground water flowing to the east and south east. The sands at the surface of the site are generally highly permeable, though low lying areas exhibit ponding as a result of the migration of finer materials to these areas via overland flow.

1.2 Site History

The site had been in operation since the 1950s. The site operators have reportedly been acquiring and processing electrical transformers since the late 1960s. Metals reclaimed from wire in electrical equipment were smelted on site in a small furnace adjacent to the SES office; oils reclaimed from transformers that were being scrapped provided the fuel for this furnace.



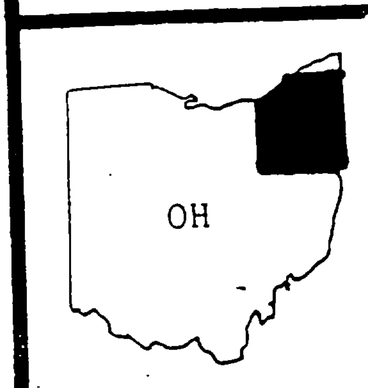


FIGURE 1

LOCATION MAP

SUMMIT EQUIPMENT AND SUPPLY

AKRON, OHIO

NO SCALE

N

WESTON

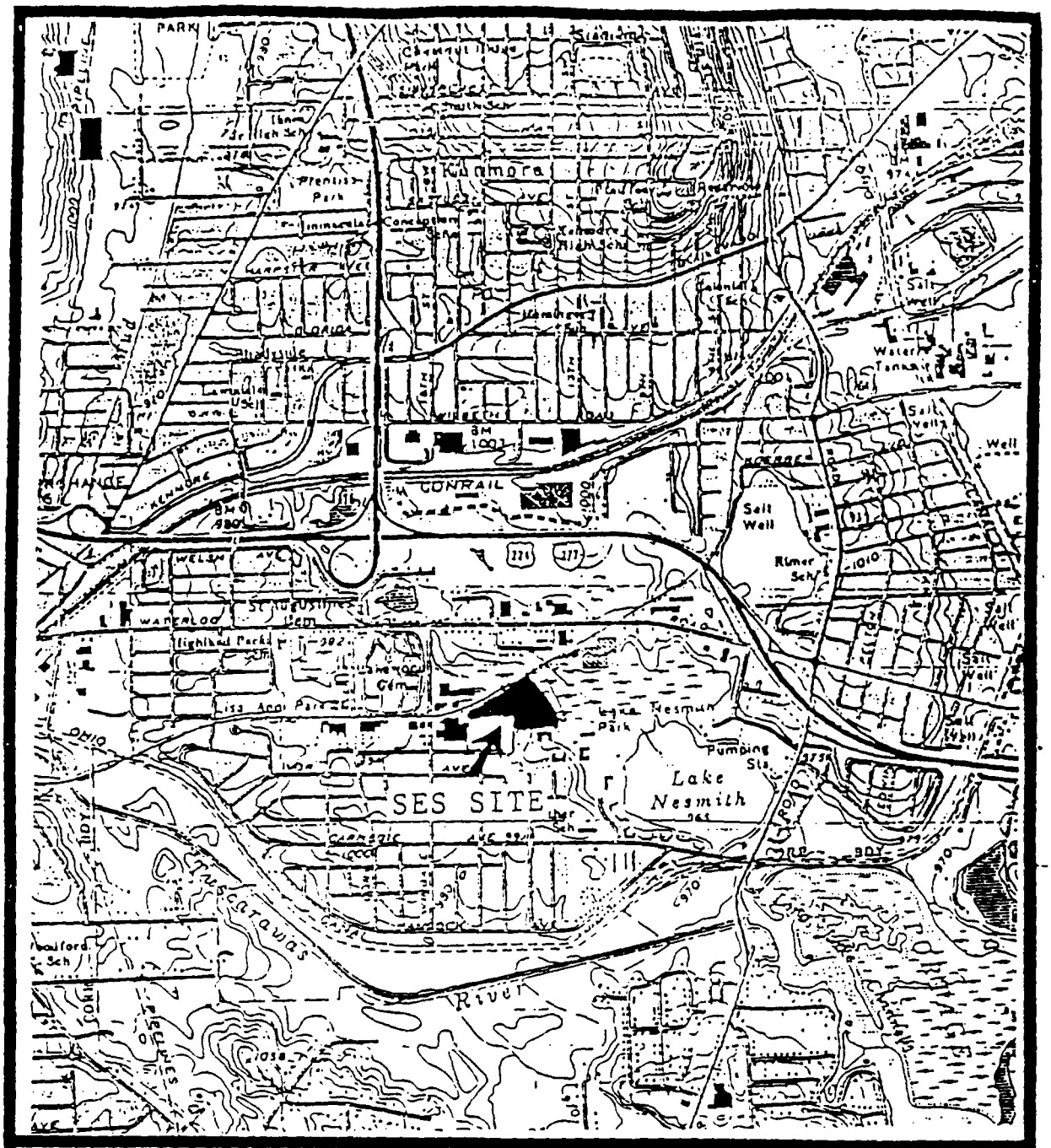


FIGURE 2

SITE LOCATION MAP

SUMMIT EQUIPMENT AND SUPPLY

AKRON, OHIO

NO SCALE

N

WESTON

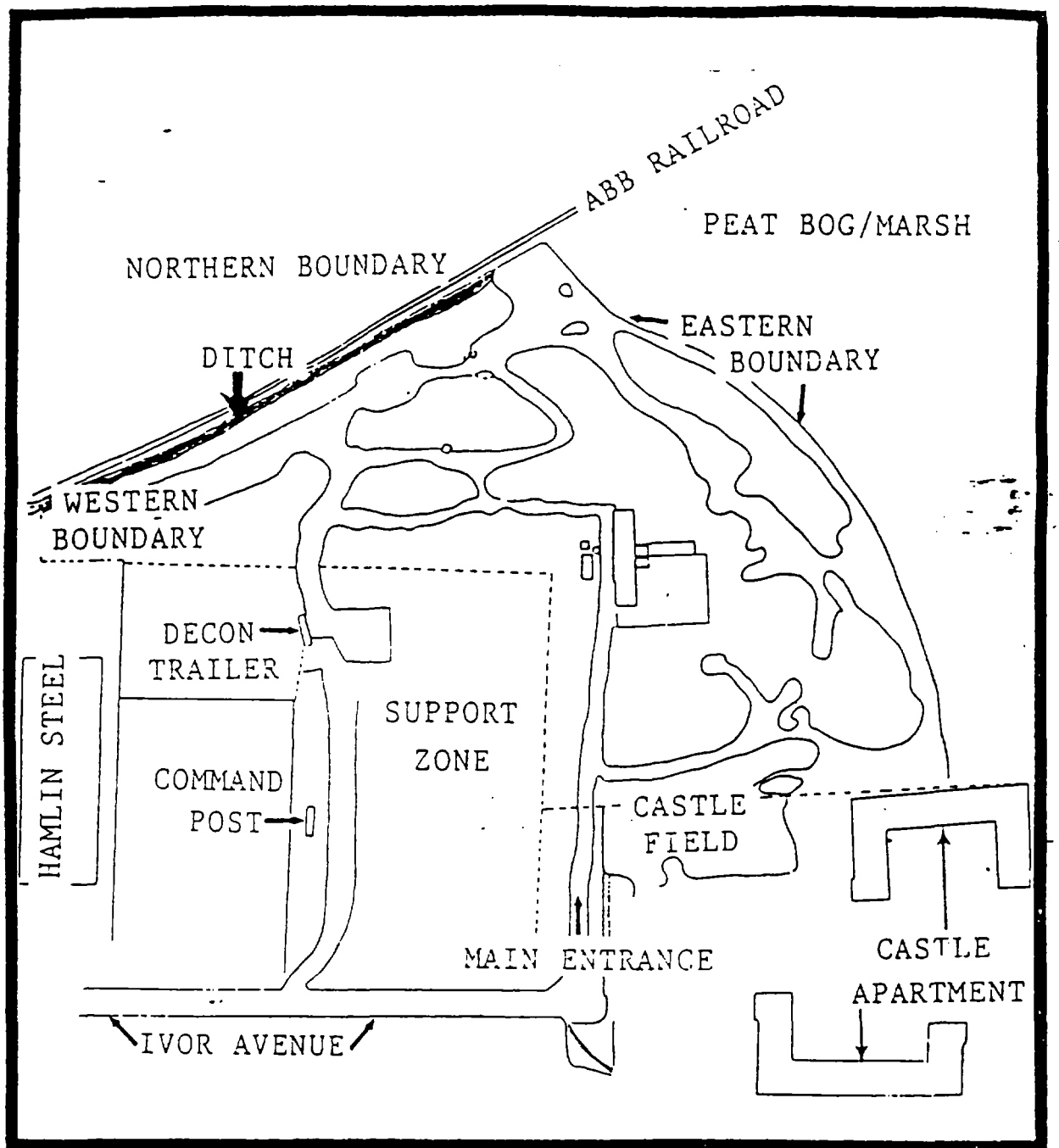


FIGURE 3

SITE MAP

SUMMIT EQUIPMENT AND SUPPLY

AKRON, OHIO

0 65 130 195
Scale (feet)

N

WESTON

In July 1986, the Ohio Environmental Protection Agency Office of Emergency Response (OEPA/OER) received a complaint from the Akron Police Department regarding inappropriate handling of transformers at the site. A compliance inspection was subsequently performed by the OEPA/OER, pursuant to the U.S. Environmental Protection Agency (U.S. EPA) Pilot Toxic Substance Control Act (TSCA) Cooperative Enforcement Program. During the July 1986, inspection, the OEPA/OER inspectors reported an estimated 2,000 transformer carcasses, several capacitors and numerous areas where spills were suspected to have occurred on the site. Five soil samples were collected on site. PCBs were detected in all of these samples at levels ranging from 180 parts per million (ppm) to 74,000 ppm. In an October 1986 letter, OEPA/OER advised the owners of the facility of the PCB contamination and suggested that the company retain a consultant to further evaluate and remediate the problem.

On February 3, 1987, the U.S. EPA Region V Emergency Response Section (ERS) was notified by the Region V TSCA Section of the high levels of PCBs present at the site. TSCA requested that the ERS evaluate the site with respect to potential off-site migration of PCBs.

1.3 Site Inspection

On February 5, 1987, ERS and Technical Assistance Team (TAT) personnel performed a site investigation at SES. The site was observed to be in the condition reported by the OEPA/OER.

The TAT collected 25 soil samples in potential off-site receptor locations. Results of sample analyses, received on February 12, 1987, demonstrated low levels of PCBs (less than 20 ppm) in residential areas to the south of the site. Samples collected from drainage ditches along the site's northern perimeter showed PCBs present at levels ranging from 550 to 8,700 ppm. The ditches drain into a large marsh area to the east of the site, which drains to Lake Nesmith, further to the southeast.

On February 19, 1987, TAT collected eight additional samples to further define the contaminated off-site areas northwest and northeast of the site. Results of these samples indicated that no up-gradient source existed and that the contamination was limited to the ditch.

Subsequent to notification by the ERS, U.S. Occupational Safety and Health Administration (OSHA) personnel inspected the SES facility on February 17, 1987.

1.4 Purpose and Objective

This project was conducted in conjunction with the OSC Support Technical Direction Document (TDD) #5-8703-14 for a removal action at the SES site. The main objective of the extent of contamination (EOC) study was to delineate areas of PCB contamination, through sampling and observation, associated with the activities carried out during operations at SES. Obtaining rapid analytical results was essential in minimizing costs on the Emergency Response Cleanup Service (ERCS) contract, because the ERCS contractor was mobilized and capable of performing work essential to stabilizing the site and mitigating threats to the populace and the environment as areas of contamination were determined.

The results of the sampling efforts will be evaluated and recommendations for further actions with respect to removal actions and continued sampling will be presented.

1.5 Scope of Sampling

The SES sample plan consisted of the collection of samples on-site and adjacent the site boundaries to delineate migration of contaminants and to establish off-site levels of contamination. The on-site samples consisted of surface samples to delineate lateral extent, and test pits sampled to a depth of 4 ft in specific areas to delineate vertical extent of contamination. Three monitoring wells were installed on site to facilitate ground water sampling with the borings utilized for deep soil sampling.

The sampling of the site perimeter was conducted to allow for rapid detection of contaminated areas off site, with provisions for follow-up sampling in areas which appeared to be contaminated. The original off-site sampling had to be expanded when it was discovered that soil material was removed from a contaminated off-site area and used as beach sand on an adjacent property. All areas off site where soil removal occurred were re-sampled following the soil removal.

A strict quality assurance/quality control (QA/QC) program was maintained throughout the entire project. Sample matrices parameters and total number of samples analyzed throughout the investigation are summarized in Table 1.

2.0 SAMPLE LOCATIONS

2.1 Off-Site Samples

During initial emergency actions at SES, a 7-ft high chain link fence was installed around the area considered to be the "site" (Figure 3). The fence enclosed approximately 6 acres, containing

TABLE 1

SAMPLE MATRICES AND PARAMETERS
TAT EXTENT OF CONTAMINATION
SUMMIT EQUIPMENT AND SUPPLIES
AKRON, OHIO

MATRICES	PARAMETERS	QUANTITY ANALYZED
Soil/Sediment	PCB	501
Soil	Priority Pollutant Metals	10
Soil/Ash	Dioxin/Furan	4
Swipe ($100cm^2$)	PCB	36
Oil	PCB	57
Ground Water	PCB	16
Ground Water	Priority Pollutant Metals	6
Surface Water	PCB	6
Air Samples Partic./Vol.	PCB	49

the majority of the scrap steel, transformers and capacitors. Samples considered "off site" were anything outside of this fenced area.

2.1.1 Perimeter

The perimeter of the site, shown in Figure 3, can be divided into five separate regions:

- North boundary, including the drainage ditch;
- West boundary, including the Hamlin Steel property and outfalls;
- East boundary, including the wetland immediately east of the site fence;
- Support Area, including the eastern portion of Ivor Avenue; and,
- Castle Apartment property immediately south of the site.

2.1.1.1 North Boundary

The north boundary, which was sampled for the site assessment, was re-sampled following excavation to verify that PCB levels above the action level were no longer present. Initially, one composite sample and two grab samples were collected along the railroad drainage ditch north of the site. When these samples were determined to contain significantly high levels of PCBs, the soil was removed from this ditch and placed on site. The post sampling of this ditch consisted of two composite samples extending from west to east along the ditch and the southern bank of the ditch. In addition to these composite samples, 19 grab samples were collected linearly along the ditch and the southern bank. These 19 samples were collected at 9 stations positioned approximately 40 ft apart, with each station consisting of a sample collected within the ditch and above the ditch on the south bank. One duplicate sample was also collected along the ditch.

2.1.1.2 West Boundary

Samples were collected along the western edge of the site on property owned by Hamlin Steel and along the railroad right-of-way. The samples were collected to substantiate the presence or absence of an up-gradient source of PCB contamination. Samples were collected at points where contamination potentially migrated from an off-site location. These areas included the western and far western extent of the railroad ditch, before it crosses

Wingate Avenue, and all of the soils at outfalls from the north side of the Hamlin Steel Products building. These outfalls included residue from floor drains within the plant, roof drains, parking lot storm water drains and steam cleaning waste water. Samples were also collected of material around storm water grates and stained soil areas outside of the entrance to Hamlin Steel.

2.1.1.3 East Boundary

The eastern extent of sampling pertains to samples collected east of the site boundary fence with the railroad property to the north and the Castle Apartment property to the south as the designated sampling boundaries. Soil samples were collected along Kohler Ditch south of the railroad to substantiate if overland flow had carried PCBs to the waterway leading to Lake Nesmith.

Investigations of historic photos revealed a discernible drainage-way among the hardwood trees in the marshy area, between the site boundary, Kohler Ditch, and Lake Nesmith. The drainage swale did not have actual flow, and five samples of organic detritus were collected along its extent. Samples of the soil were also collected between this swale and the site's eastern boundary from areas where transformers had been removed and along foot paths through the woods.

2.1.1.4 Support Area

The support area, consisting of the property immediately south of the site yet west of the entrance to the site, includes: Ivor Avenue, the parking area north of Ivor Avenue, the old ball field (empty lot), the south gate and auxiliary road to the site (decon area), and the driveway to the main entrance of SES. The soils were sampled for PCBs in these areas, near site access points, to determine the impact from pedestrian and vehicle tracking from the site. The samples included composites collected of the material which accumulated along the Ivor Avenue curb and a grab sample collected from the catch basin on Ivor Avenue. Ivor Avenue was divided into five sections extending east from the west curb of Pike Street to the point where Ivor Avenue terminates at the driveway to SES. The street itself was sampled as three sections, with each 60 ft section composited from the material observed along both curbs and the middle of the street. Aliquots from the north tree lawn and south tree lawn along this entire portion were also composited separately.

2.1.1.5 Castle Apartment Field

As sampling progressed around the perimeter of the SES site, samples were collected in the field east of the main entrance to SES. On March 16, 1987, six samples were collected between the

southeast portion of the site and the apartment building, as well as along the existing site fence on the north edge of the open field. To verify the results of these samples, 13 soil samples were collected along this same area and extended back 50 ft from the fence. Upon receipt of these results it was determined that further sampling of the field was necessary. The sampling grid cordoned the field into 6 rows spaced 25 ft apart, beginning at the fence at the north and proceeding south. The samples were collected from the surface to a 3 inch depth and were staggered at approximately 25 ft intervals from one row to another, effectively providing a sample every 50 ft per row (Figure 4). The results of this sampling led to the excavation of an area 220 ft by 90 ft to a depth of 0.5 to 1 ft.

After the excavation of the contaminated soil, 12 additional samples were collected from an area parallel to the fence and extending 50 ft south. These samples indicated further excavation was necessary. After the second soil removal took place of an area 120 ft by 70 ft and averaging 2 ft in depth, two samples were collected in this area. These samples led to the excavation of four test pits which were sampled at 1 ft intervals to a depth of 4 ft, with one test pit sampled to 5 ft (Figure 4A). The depths sampled were from the open excavation depth and did not account for the soil which had previously been removed from these locations.

Soil was removed three additional times in this area, with samples collected after each removal. Further interviews with the property owner revealed that there was, at one time, a shallow gully or washout leading from the site at the point which indicated evidence of contamination. After receiving this information, a series of 16 excavations were initiated May 5, 1987 south of the area in which prior removal actions had been executed (Figure 4A). These excavations were sampled at 1 and 3 ft depths with 25 of the 32 samples undergoing analysis.

2.1.2 Lake Nesmith Beach Sampling

Sampling was initiated along the beach on the south shore of Lake Nesmith (Figure 5) after the investigation and sampling along the south perimeter of the Summit Equipment Site revealed significant off-site contamination in a borrow area used to replace sand which had eroded from the beach.

After speaking with the contractor who had performed the placement and grading work at the beach, the TAT was able to designate preliminary areas to be sampled for potential PCB contamination on the beach. Samples were initially collected in the area that received the majority of the fill. These six initial samples, from the west end of the beach at the southwest corner of Lake Nesmith, were collected from the surface to a depth of 4 inches,

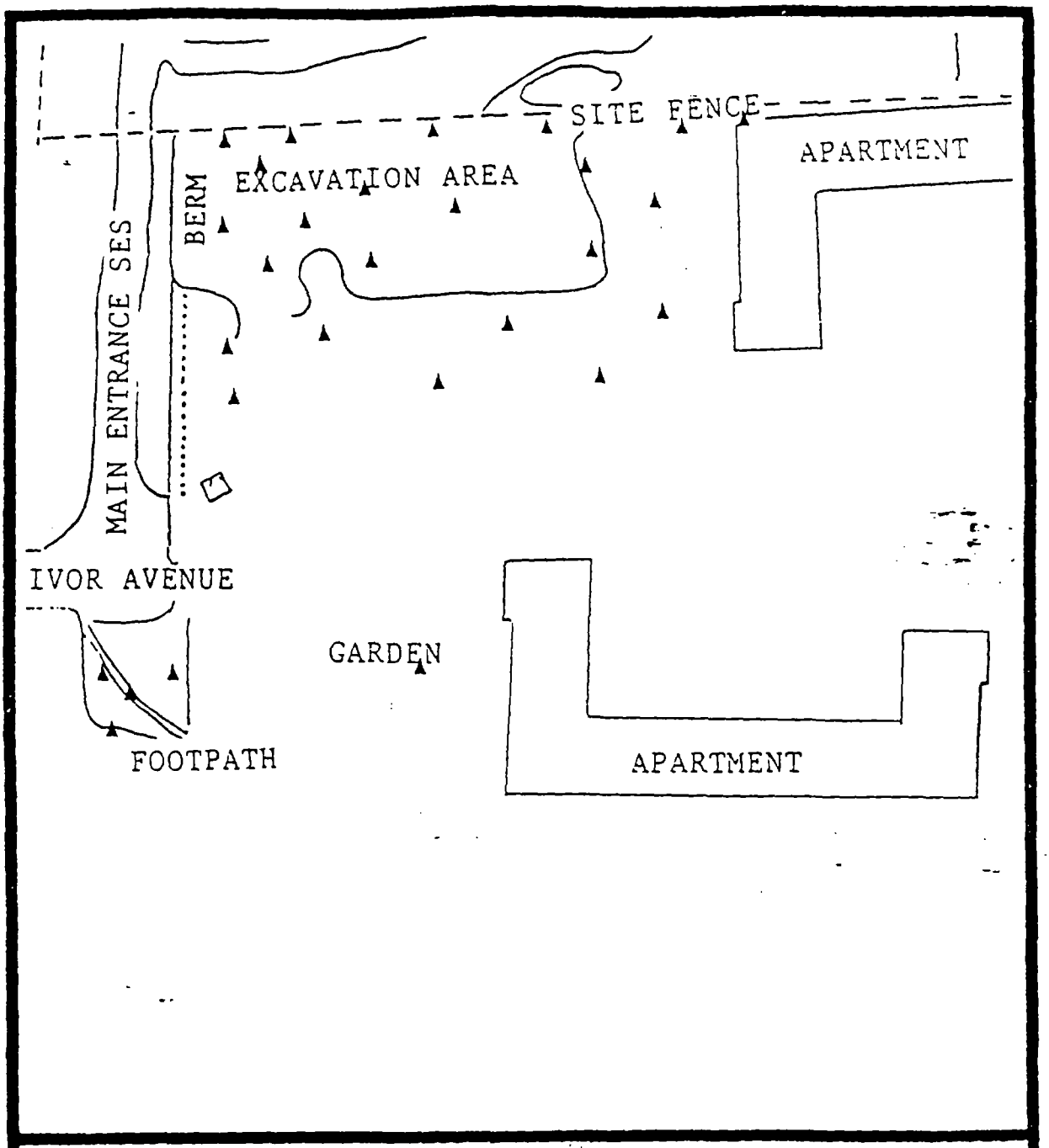
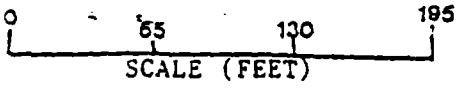


FIGURE 4

CASTLE APARTMENT FIELD SAMPLING MAP

SUMMIT EQUIPMENT AND SUPPLY

AKRON, OHIO



WESTON

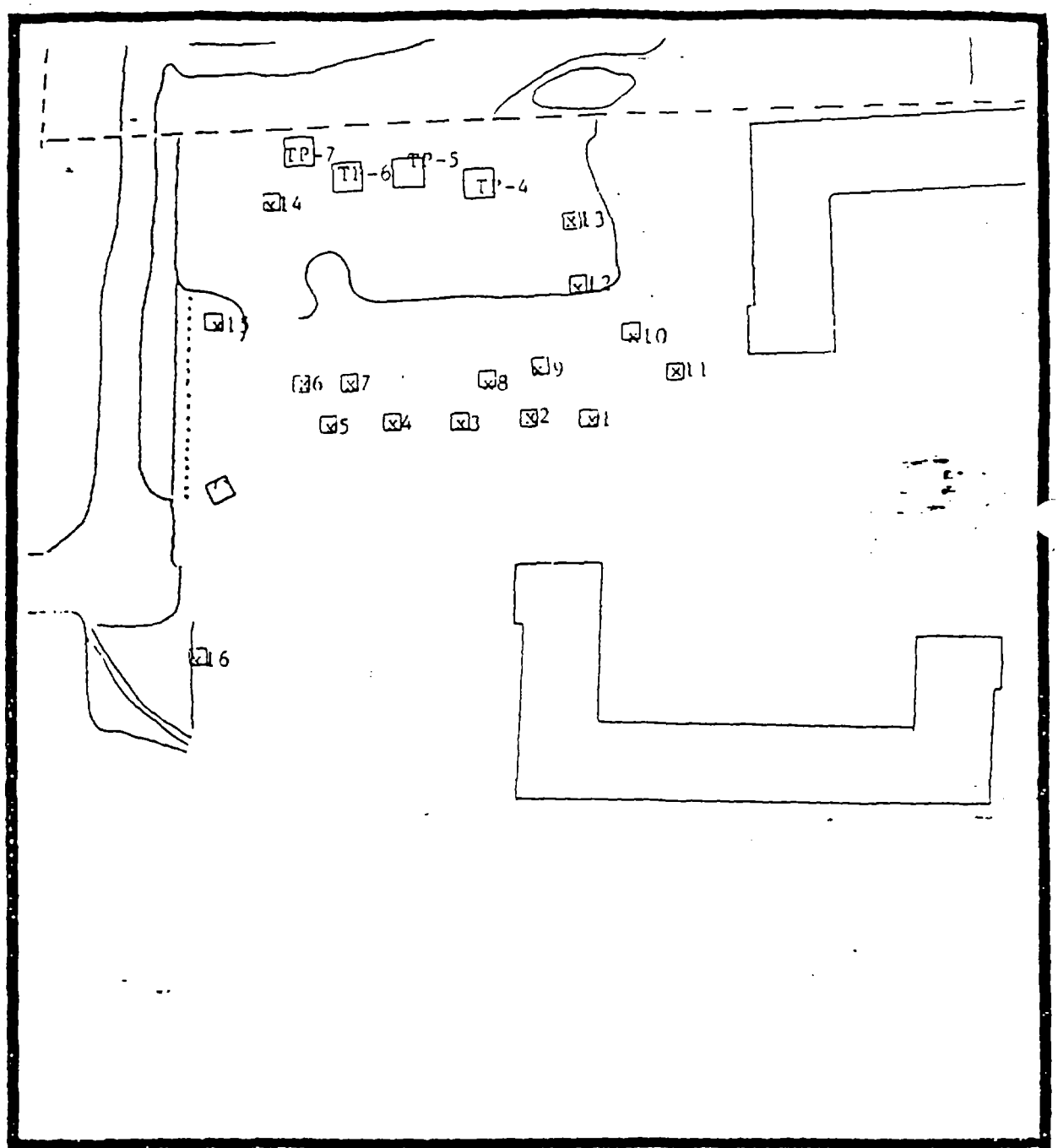


FIGURE 4A

CASTLE APARTMENT FIELD
TESTS PITS AND SAMPLE EXCAVATIONS
SUMMIT EQUIPMENT AND SUPPLY
AKRON, OHIO

0 65 130 105
SCALE (FEET)

N

WESTON

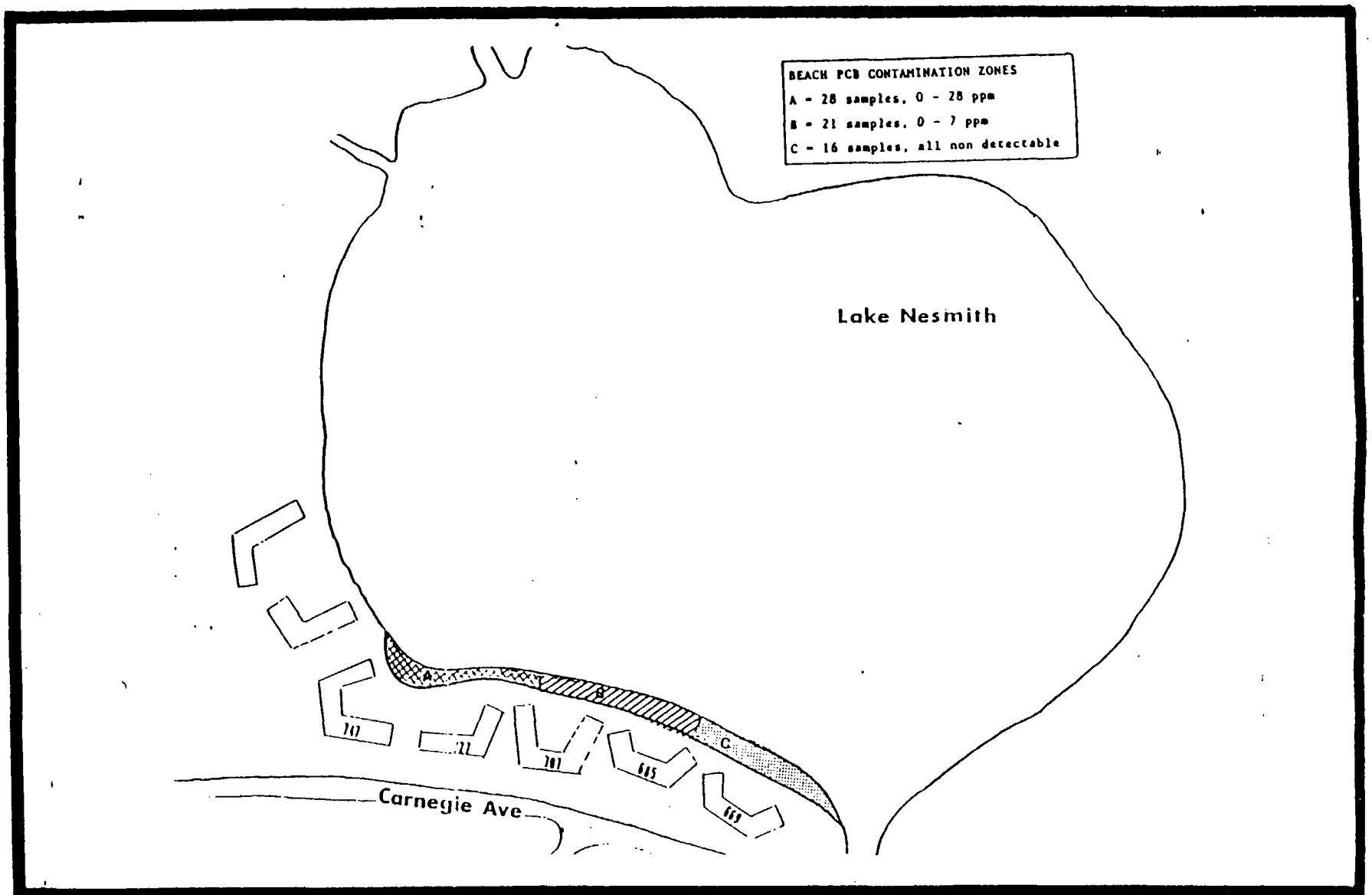


FIGURE 5
LAKE NESMITH BEACH SAMPLE LOCATIONS
SUMMIT EQUIPMENT AND SUPPLY
AKRON, OHIO

N

WESTON

approximately 12 ft from the sand/grass contact. After receipt of analytical results, it was determined that sampling should be extended east of this initial area to a point approximately midway down the beach, believed to be the furthest eastern extent of fill placement.

The next stage of sampling proceeded west from a point 30 ft east of a roof drain emptying into the lake, immediately in front of the western wing of the apartment at 707 Carnegie Avenue. This was believed to be the furthest point east on the beach where fill material had been placed. The majority of the 25 samples were collected from the surface to 3 inches with 5 samples being collected from depths of 8 to 10 inches. The stations were 10 ft apart, with locations alternating from 2 ft in from the grass to 1 ft in from the water's edge; the stations proceeded west on the beach to the point of the initial sampling's eastern extent. Two samples were then collected at depths of 8 and 9 inches in the area of the initial samples.

The third stage of beach samples consisted of 23 samples, collected May 18, 1987. The samples were collected from the previous eastern-most sample point to the eastern end of the beach, with samples collected every 33 ft, from the surface to 4 inches in depth. The samples were collected from the center line of the beach, as dictated by the water level, equidistant from the shoreline and lawn.

The fourth stage of sampling on the Lake Nesmith beach consisted of the collection of 22 samples on May 27, with 15 of those samples collected submitted for analysis. The samples were collected beginning at the far eastern portion of the beach and overlapped the third stage of sampling. The samples were collected alternating above and below the center line of the beach, between the third stage samples. Essentially, the sampling effort gave the eastern portion of the beach a zig-zag sample pattern which included: the beach just above the water line, the center of the beach, and the upper beach just in front of the lawn. The samples were collected from the surface to a 3 inch depth and were spaced linearly at 33 ft, between each of the third stage samples.

The sampling of the beach, after the excavation of PCB contaminated sands, from the west edge to a point approximately 600 ft east consisted of eight samples. The samples were collected at the surface to 3 inches, after 6 to 9 inch layer of sand was removed. All of the samples were collected from the center of the beach and spaced at 80 ft, with one sample being a duplicate.

There were a total of 86 samples collected along the 950 ft beach, 78 of which were analyzed.

2.1.3 Lake Nesmith Sediments

Samples were collected of sediments in Lake Nes analysis. There were 37 samples collected immedia south shore beach, 24 of which were analyzed. These s collected in 2 to 3 ft of water, 8 to 20 ft from th shown in Figure 6. An additional three samples were from deep water sediments: one directly off the western 6 ft of water, 40 ft from shore; one at the center of the 24 ft of water; and one across the lake at a similar dep distance from the shore as the sample collected near the (Figure 7).

2.1.4 Lake Nesmith Surface Water

A total of six water samples from Lake Nesmith were collected and analyzed for PCBs in this investigation. As the contaminated beach appeared to be the sole source of PCB contamination, water samples were collected immediately off-shore in the wading zone along the beach (Figure 8). Five samples were collected by wading into the lake from the shore, while the sixth sample was collected from a boat in the shallows, to minimize turbidity.

2.1.5 Air Samples

During the excavation of soils from the off-site area near Castle Apartments and placement of this material on site, Gillian pumps were used near the excavation area and along the site perimeter to monitor levels of particulate and volatile PCBs in the air. Five pumps were mounted at a height of 6 ft and situated around the site to monitor for PCBs, which may have been released during the removal action. As indicated in Figure 9, four of the stations were placed between the site and nearby residents while a fifth station was placed at the northeast portion of the site to act as a downwind sample. The Gillian pumps were not used at the northern perimeter along the railroad or along the eastern portion of the fence immediately north of the apartments due to the likelihood of vandalism in these areas.

2.2 On-Site Samples

2.2.1 Soil

2.2.1.1 Surface - PCBs

The SES site consisted of approximately 6 acres of scrap steel, electrical equipment and miscellaneous debris overlying glacial sand and gravel deposits. Soil development on the site was practically nonexistent, as fine sand was the predominant material found at the surface of the site. The clutter of materials on site made it impossible to formulate a workable random sampling

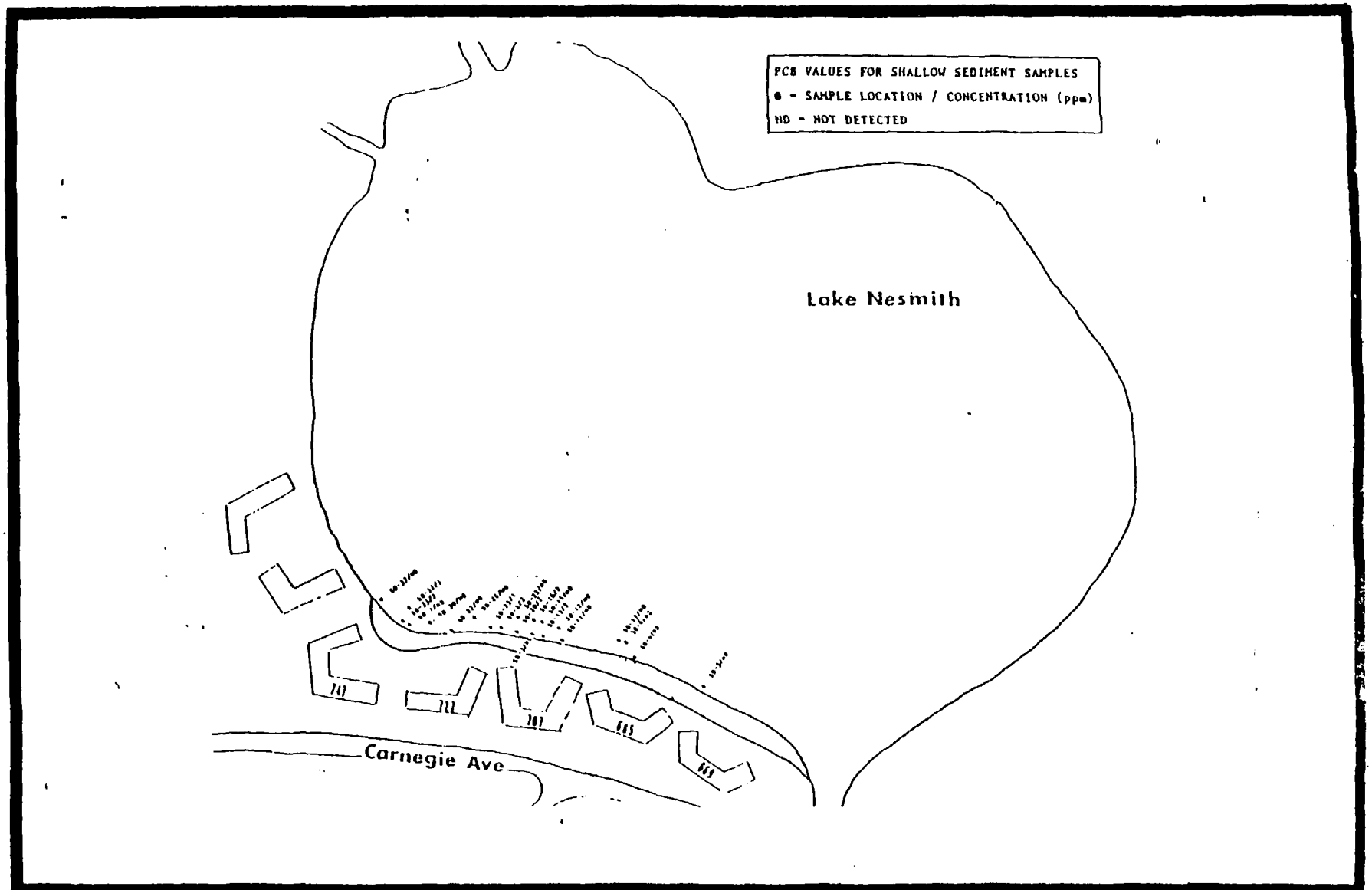


FIGURE 6
SHALLOW SEDIMENT SAMPLE LOCATIONS (LAKE NESMITH)
SUMMIT EQUIPMENT AND SUPPLY
AKRON, OHIO

N

WESTON

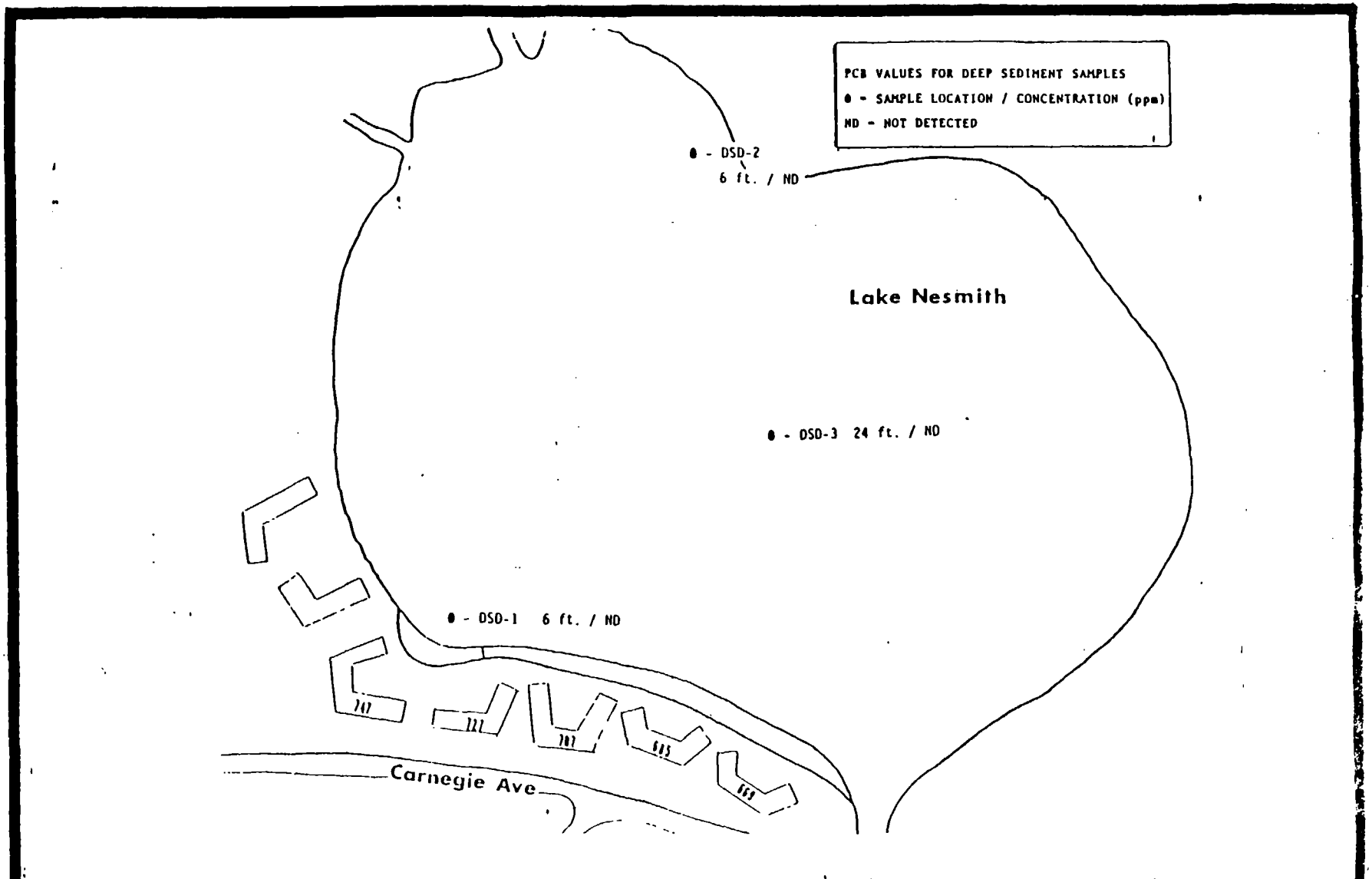


FIGURE 7
DEEP SEDIMENT SAMPLE LOCATION (LAKE NESMITH)
SUMMIT EQUIPMENT AND SUPPLY
AKRON, OHIO

N

WESTON

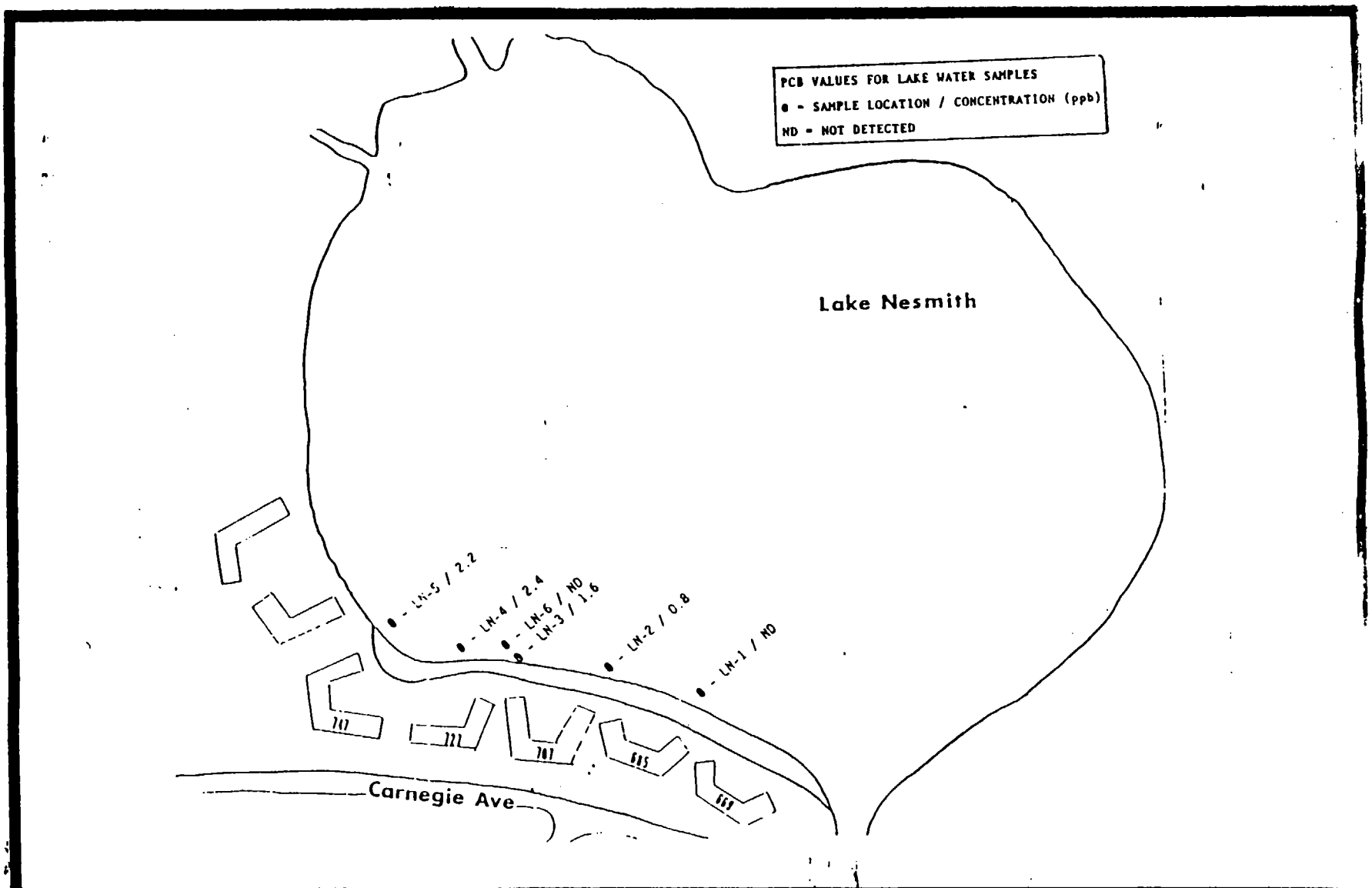


FIGURE 8
LAKE NESMITH SURFACE WATER
SUMMIT EQUIPMENT AND SUPPLY
KRON, OHIO

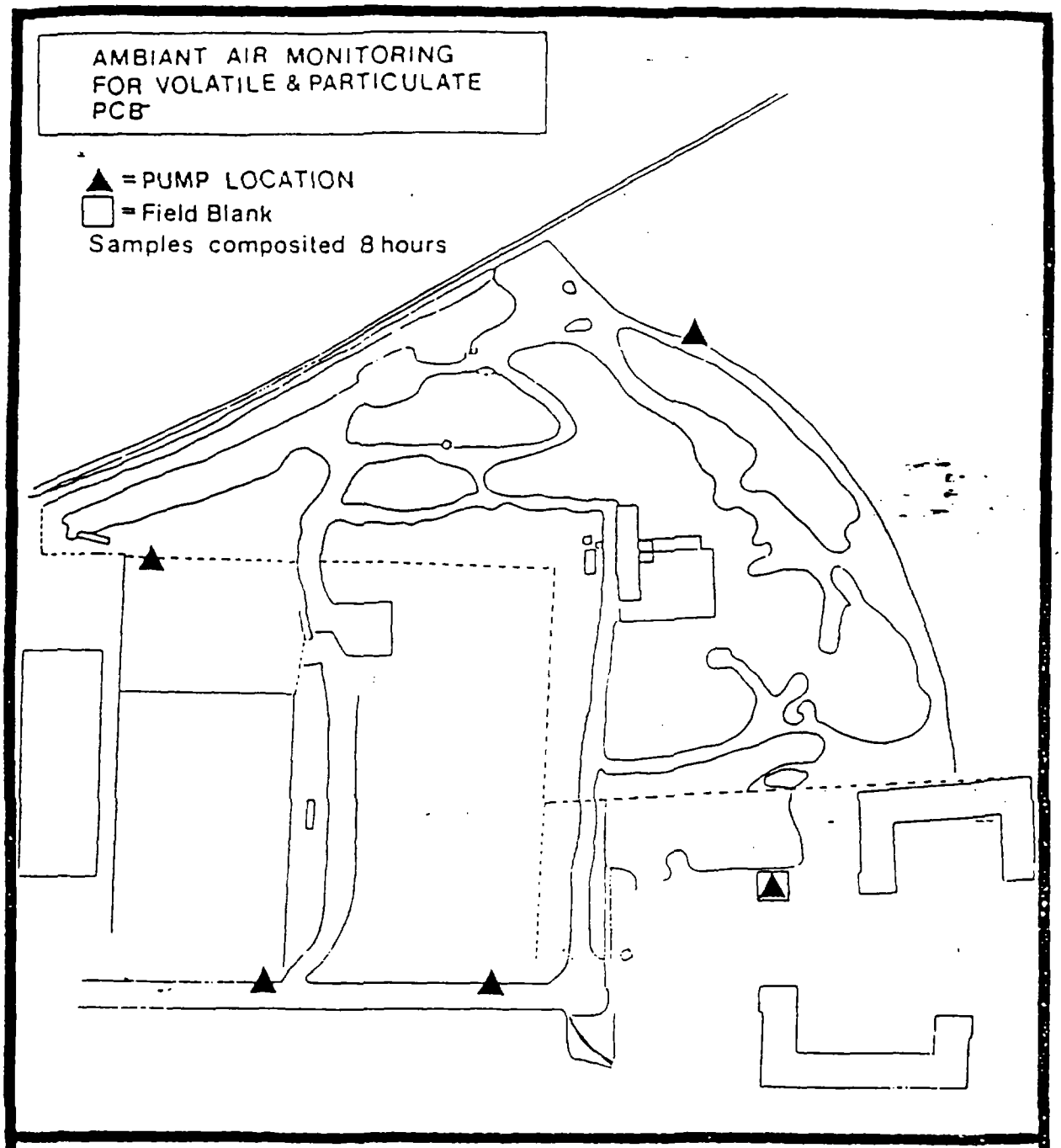


FIGURE 9

AIR SAMPLING LOCATIONS

SUMMIT EQUIPMENT AND SUPPLY

AKRON, OHIO

0 65 130 195
Scale (feet)

N

WESTON

pattern; therefore sampling of the "soils" necessitated establishing a sample collection plan in the field, after preliminary concepts were derived in the office. The sample plans were finalized after consulting with the OSC to establish the number of samples to be collected from any one location.

Locations to be sampled on site were determined by accessibility to bare soil and the type of scrap and debris which had been removed from the area. Samples were collected where transformers or large electrical devices with capacitors were observed, in areas of observed soil staining, or where there was additional evidence of tampered transformers. Samples were also collected in both channeled and ponded run-off water areas.

Each sample was recorded on a map with an alpha-numeric grid system capable of recording the sample within a 6.5 ft square (Figure 10). The collection of over 130 samples in this manner was limited mostly to open roadways and foot paths through the debris.

2.2.1.2 Subsurface - PCBs

Seven test pits on site were sampled for PCBs, with each test pit having a minimum of three samples collected. The test pits were located in areas which showed heavy surface soil contamination or exhibited other evidence of transformer salvaging (Figure 11). Three test pits were sampled to a depth of 4 ft, while the others were sampled to a depth of 3 ft. The depths were determined both by the type of equipment used to excavate the test pit as well as depth to which a test pit would stay open in the loose sand. Each test pit was also located alpha-numerically on the base map used for on-site sample locations.

Borings were placed along the eastern perimeter of the site to facilitate the installation of ground water monitor wells. The wells were placed along this perimeter, as the ground water flow from beneath the site was believed to flow in an easterly direction and the road along the perimeter allowed the best access for down-gradient monitoring. Ten soil samples from the soil borings were analyzed for PCBs. Each of the three borings had samples analyzed from near the surface, 1 to 3 ft, and at the water table (6 to 10 ft). A sample was also collected from the first portion of the soil column which exhibited fine material (silts or clays). It was thought that if the PCBs oils had infiltrated the ground near any of the borings they would have concentrated in any or all of these locations.

2.2.1.3 Surface - Priority Pollutant Metals

The SES site also operated a small battery recycling area and copper and lead reclaiming smelter. Due to mishandling of these

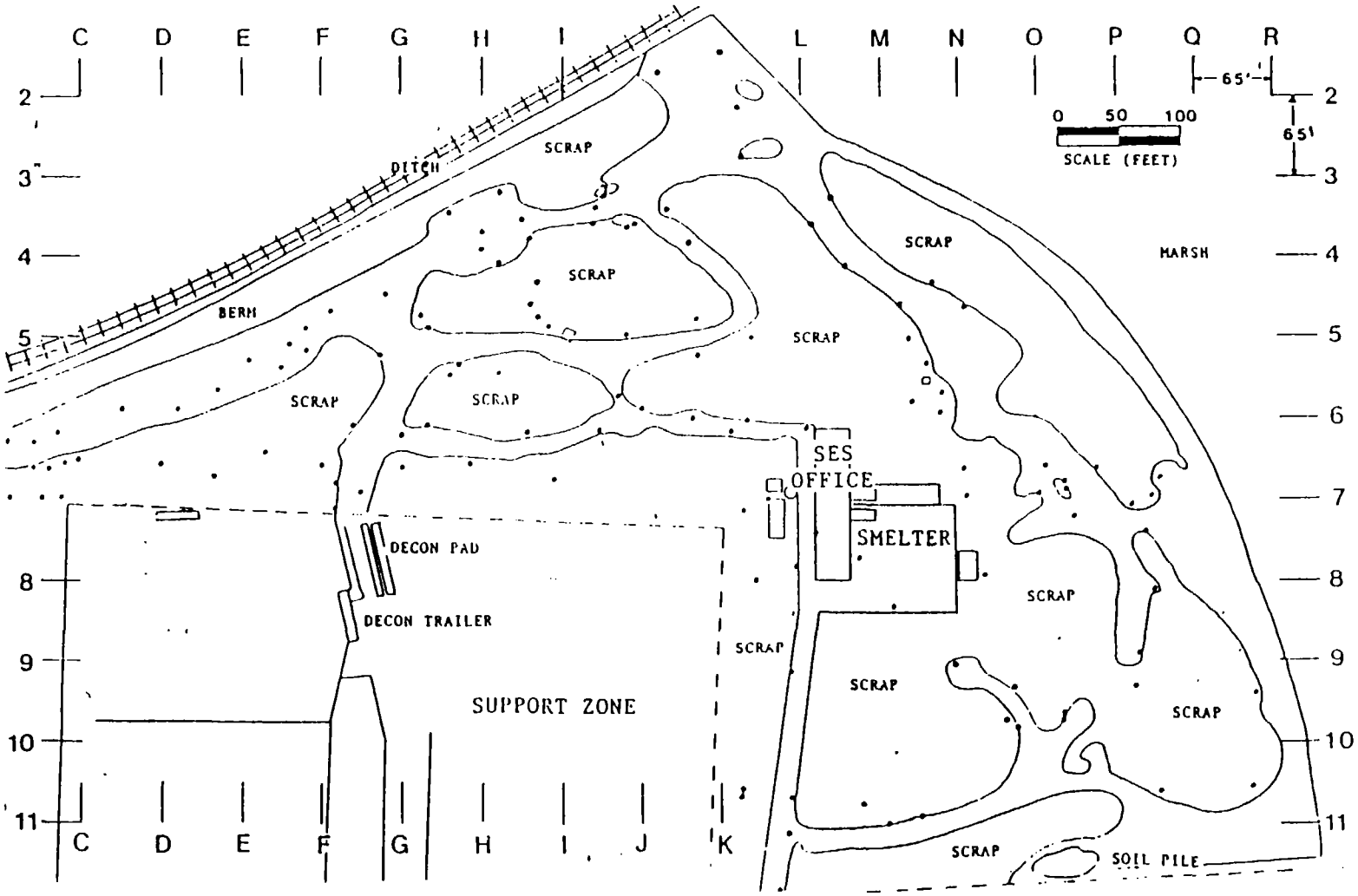


FIGURE 10
ON-SITE PCB SAMPLE LOCATIONS
SUMMIT EQUIPMENT AND SUPPLY
AKRON, OHIO

N

WESTON

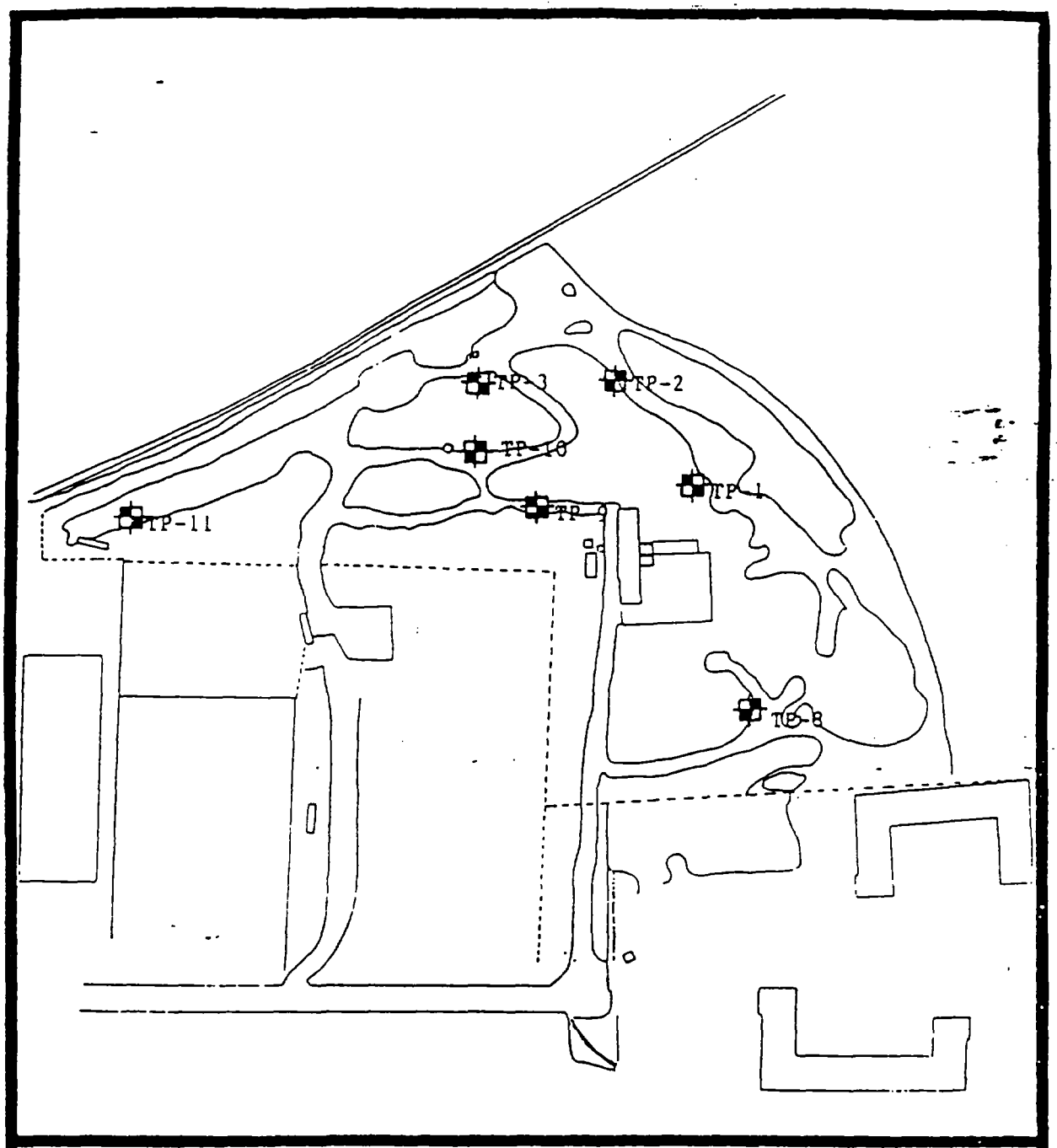


FIGURE 11

ON-SITE TEST PIT LOCATIONS

SUMMIT EQUIPMENT AND SUPPLY

AKRON, OHIO

0 65 130 195
Scale (feet)

N

WESTON

operations, it was believed that heavy metals contaminated portions of the site. Nine soil samples were collected on site for Priority Pollutant metals.

The soils were sampled for metals at locations where accumulation of metals could occur, such as: areas where batteries were broken or stored, the smelting area, wire stripping area, and areas where burning of wires had occurred (Figure 12). The samples were all collected from the surface to a depth of 3 inches, and were located on the base map alpha-numerically. A background sample of similar soil type was collected east of the site, off of the road leading to Castle Apartments.

2.2.1.4 Surface - Dioxin/Furan Analysis

Analyses for concentrations of dioxins and dibenzofurans were conducted because of the quantity of transformers and capacitors containing PCBs found at the SES site, along with the burning operations. The dioxin/furan investigation was comprised of four samples collected in areas which were designated as burn areas. Each area showed evidence of ash and charred debris. The samples consisted of six to nine aliquots composited from the debris in each of the designated areas. One sample was collected from scrapings collected from inside of the chimney and hearth of the smelter, immediately adjacent to the office on the east side. The other samples were collected from the ground, and are indicated on Figure 13.

2.2.2 Ground Water

After reviewing the literature available on the hydrogeology of the area and performing a reconnaissance of the site, it was concluded that ground water investigation should be initiated. The topography of the site was studied and it was determined that three wells would be sufficient to monitor the down-gradient portion of the shallow unconfined aquifer. During the period of May 12, 1987 to May 20, 1987, three down-gradient wells and one up-gradient well were installed. The down-gradient wells were placed on site along the eastern perimeter, along the road which was cleared during the placement of the perimeter fence (Figure 14). The up-gradient well was placed immediately north of the Hamlin Steel products building, northwest of the site and north of the railroad tracks.

The 10 ft well screens were each set immediately beneath the zone of saturation with the screens extending to a depth of 17 to 25 ft. The water table was encountered from 7 to 16 ft below grade depending on the surface elevation of the well (Table 2). The water table is relatively flat with a slight gradient to the southeast (Figure 14). The wells were sampled for PCBs in May and July. The July sampling consisted of both skim samples and

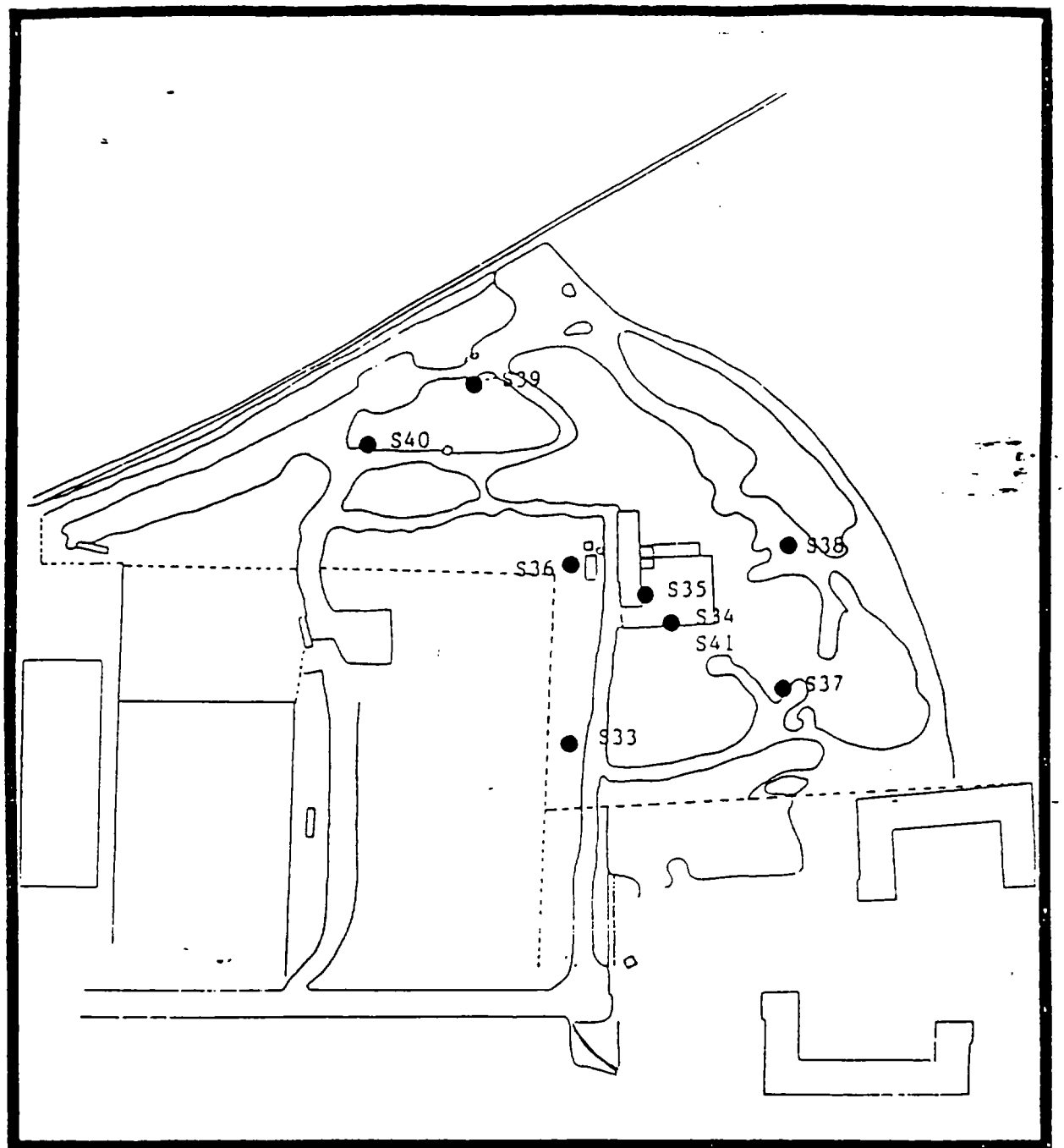


FIGURE 12

PRIORITY POLLUTANT METALS SOIL SAMPLE LOCATIONS

SUMMIT EQUIPMENT AND SUPPLY

AKRON, OHIO

0 65 130 195
Scale (feet)

N

WESTON

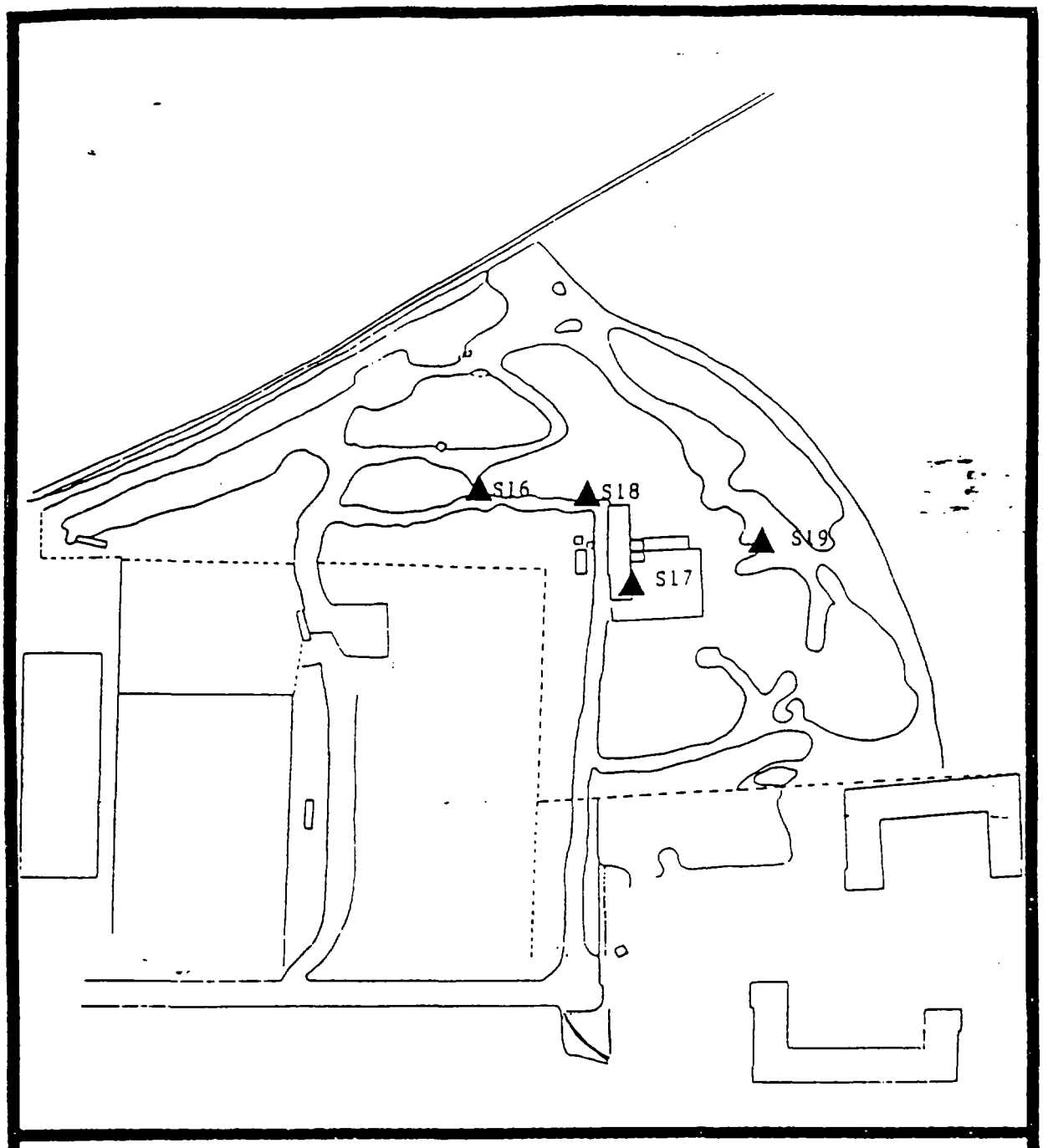


FIGURE 13

DIOXIN/FURAN SAMPLE LOCATIONS

SUMMIT EQUIPMENT AND SUPPLY

AKRON, OHIO

0 65 130 195
Scale (feet)

N

WESTON

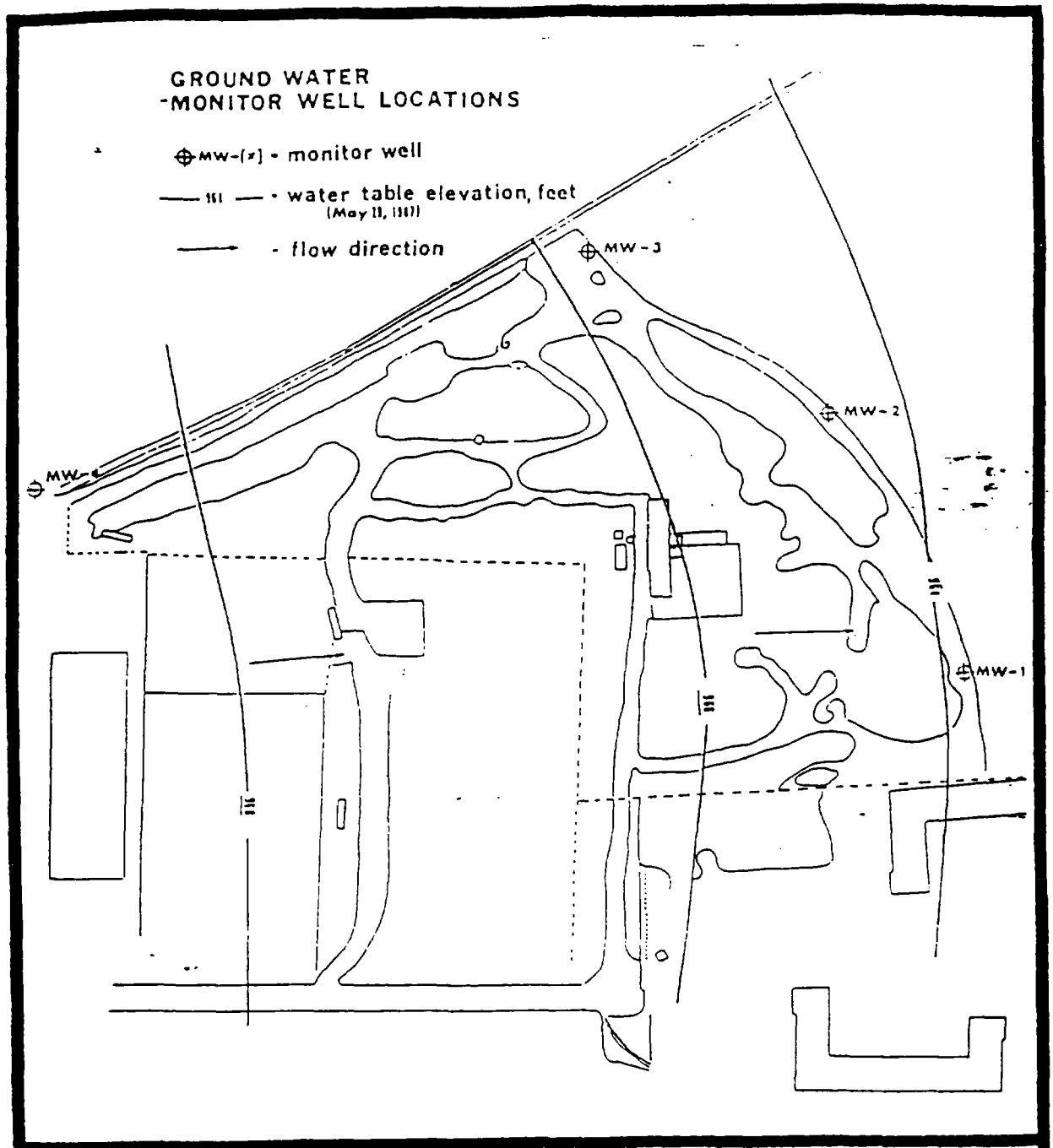


FIGURE 14

WELL LOCATION MAP

SUMMIT EQUIPMENT AND SUPPLY

AKRON, OHIO

0 65 130 195
Scale (feet)

N

WESTON

TABLE 2

MONITOR WELL & WATER TABLE ELEVATIONS
TAT EXTENT-OF-CONTAMINATION
SUMMIT EQUIPMENT AND SUPPLIES
AKRON, OHIO

WELL NUMBER	WELL DEPTH (ft)	SURFACE ELEVATION (ft)	WATER TABLE ELEVATION (feet above M.S.L.)		
			5/29/87	7/17/87	8/5/87
1	25.5	974.94	963.94	963.61	963.15
2	20.5	972.68	965.82	965.41	965.10
3	17.5	972.47	965.92	965.47	965.22
4	25.5	984.25	968.54	967.92	967.49

purged samples. The wells were also sampled and analyzed for Priority Pollutant metals in the July/August sampling. A fifth well, used for the SES office, was also sampled for both PCBs and Priority Pollutant metals in August. The well was historically used as the sole source of water for the SES building, and is located 20 ft south of the building.

2.2.3 Swipe Samples - PCBs

Twenty swipe samples of residue and oils on metal scrap were collected and analyzed for PCBs. Surfaces sampled were selected on the basis of economic value of the metal or proximity to areas of highly contaminated soils (Figure 15). After speaking with the site operator, the TAT was able to designate areas containing material of economic value which could be removed from the site. Swipe samples were also collected from equipment which had been abandoned on site when the Removal Action began. These samples were collected within 3 ft of the ground, immediately adjacent to roadways and paths, on surfaces that were in direct contact with the soil.

Swipe samples were collected from the inside of transformers which did not contain oils at the time of staging. A total of 16 transformers were sampled with the type, approximate size and pertinent information being recorded. The main objective was to establish the level of contamination on "dry" transformers.

2.2.4 Oil/Emulsion Samples - PCB

During the staging of transformers at the SES site, 57 transformer liquid samples were collected and analyzed for PCBs. The purpose of this sampling was to identify the quantity and concentrations of PCB-contaminated liquids on site requiring disposal. The transformers containing liquid were sampled prior to staging so that liquid of similar PCB concentrations could be combined into 55-gallon drums for disposal.

2.3 Documentation of Sample Location

As each sample in the investigation was collected by the TAT, a "Field Data Sheet" was completed (Attachment A). The form in addition to providing an accurate record of the sample location on a pre-made map, allowed for pertinent information concerning the sampling event to be retained.

In addition to this form, a master map was updated to document the sample locations alpha-numerically. All sample points were marked in the field through the use of surveyor's ribbon, stakes, spray paint or any combination of these methods. In most cases the sample number was marked at the location of collection by one of these means and left in place as a reference point during the

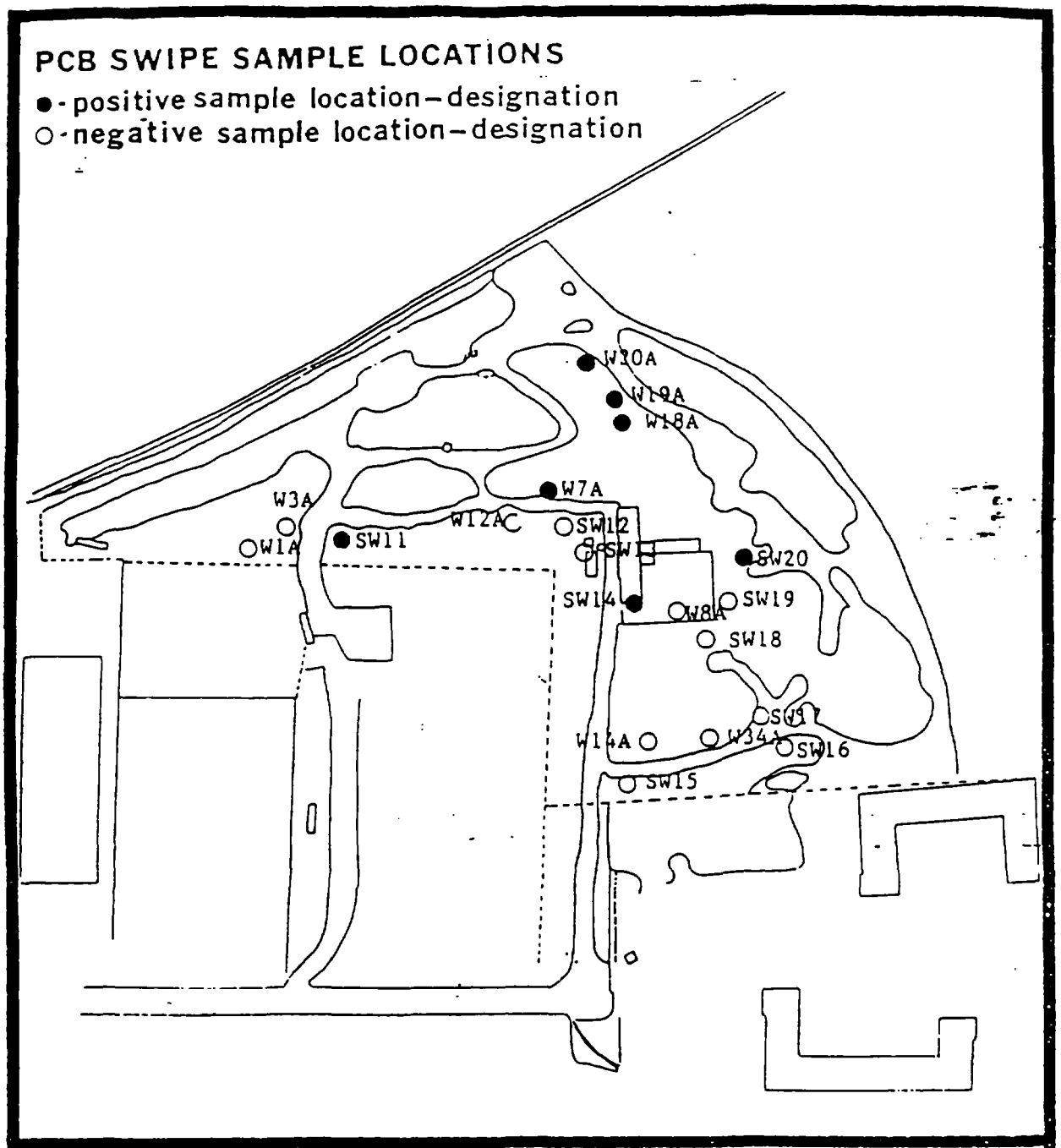


FIGURE 15

SWIPE SAMPLE LOCATION

SUMMIT EQUIPMENT AND SUPPLY

AKRON, OHIO

0 65 130 195
Scale (feet)

N

WESTON

investigation. Areas sampled off-site were also documented through photos taken to illustrate location and depth.

3.0 SAMPLING METHODS

A Standard Operating Procedure (SOP) (Attachment B) for sample collection at the SES site was established to aid in sample documentation, quality control, and expeditious work.

3.1 Soil Sampling

The soil at the SES site was generally sandy loam or uniform sand with very little clay or organic material present. This homogeneity in the soil horizon allowed consistent soil sample collection methods throughout the investigation.

3.1.1 Surface Soils

All surface soils (surface to 5 inch depth) were collected utilizing sterile wooden tongue depressors and clean, unused disposable sampling gloves. The tongue depressors and sample gloves were disposed of after each sample to ensure that samples would not become cross contaminated.

Because representative in situ soils were desired for the investigation, samples were collected, for the most part, in undisturbed areas. When this was not possible, the initial 1 inch of loose material was removed with a tongue depressor, and a clean tongue depressor was then used for sample collection.

3.1.2 Test Pit Soils

Test pits were implemented both on-site and off-site as a means of investigating the possibility of PCB contamination at depths to 5 ft. The test pits were excavated by means of heavy equipment and included the use of a large track mounted backhoe, a small backhoe, and a large front-end loader. The equipment used was based solely on availability to the task and no preference was established as to method of excavation of test pits.

Once a test pit had been excavated, a sample could be obtained at a specific depth by yardstick measurements. Two tongue depressors were utilized, as previously stated. Test pits on site were closed immediately after sampling while off-site test pits were left open until results from the samples were obtained. This eliminated the need for double excavations.

3.1.3 Deep Boring Soils

Soils were collected for the continuous length of the boring during drilling of the on-site and off-site monitoring wells.

The monitor well borings were installed with a track mounted CME drill rig utilizing a 4.25 inch hollow stem auger. Soils were sampled continuously during advancement of the boring through the use of a 2 inch outer diameter split spoon sampler. Each split spoon sample cored through and retained approximately 12 to 18 inches of the vertical profile; the core was then composited into a single 8-ounce jar. The jars were labeled with depth and boring number and retained. A tongue depressor was used in splitting and compositing the samples from the split spoon.

3.2 Water Sampling

3.2.1 Well Water

After the monitoring wells were set, each well was sampled for PCBs and dissolved Priority Pollutant metals. Due to the amount of oil that was spilled on site, water was collected from the wells both as a skim sample, before the well was excavated, and as a sample representative of the ground water. The procedure for sampling the wells is found in Attachment C. This sampling procedure was followed for two well sampling events, although the samples designated for metals analysis were collected for the second round of samples only because the presence of heavy metal contaminated soils had not been determined until after the first round.

The office well on-site was sampled once. This well was sampled from the utility sink inside the building, which was allowed to run for approximately 20 minutes before sampling in order to purge the holding tank and well casing.

3.2.2 Surface Water

Surface water samples for PCBs were collected from Lake Nesmith by two methods. The first method employed a sampler wading into the water from the shore at the beach and collecting samples by opening an 80-oz bottle while submerging it in approximately 3.5 ft of water. This method collected turbid water.

The second surface water sampling method utilized a row boat, with the water sample collected in the same manner. The boat was taken into 3 to 4 ft of water and the open bottles were submerged. This method allowed for the collection of a clear water sample, relatively free of suspended solids.

3.3 Sediment Sampling

Sediments were collected along the south shore beach at Lake Nesmith and also in deeper water along the south shore, north shore, and center of the lake. The majority of the samples were collected by wading into the shallow water along the south shore

beach of Lake Nesmith, and collecting sediment using an 8-oz glass jar. The sample was drained of as much free liquid as possible and sealed.

Three sediment samples were collected in 15 to 20 ft of water with a stainless steel dredge (Eckman Model 196-B15), hand operated from a row boat. The dredge was emptied onto a clean plastic bag and the sample was collected after the spoil had been thoroughly mixed.

3.4 Swipe Sampling

Swipe samples were collected from oil stained metal surfaces throughout the site in accordance with Region V swipe sampling policy (Attachment D).

During the SES investigation, the filter paper was folded directly in half and wiped across the metal surface with one side first and then the other. The filter paper was placed in the collection bottle/jar and sealed.

3.5 Oil Sampling

Oils were encountered in many of the transformers on site. In order to determine the magnitude of contamination of these oils, each transformer containing visible oil was sampled. Ladders were required to gain access to several of the transformers because of their size and height. In transformers that held limited amounts of liquid, a sample jar was lowered into the liquid for collection. Each sample was collected by using a distinct collection jar and sample jar.

3.6 Air Sampling

The TAT, with the assistance of the U.S. EPA Region V Eastern District Office, designed a Quality Assurance Project Plan (QAPP) (Attachment E) that established the protocol for which ambient air sampling was conducted at the SES site. Ambient air samples were collected to determined the presence of particulate and volatile PCBs.

Sampling was not conducted on days in which there was precipitation or days in which the ground surface was saturated from previous precipitation.

4.0 ANALYTICAL RESULTS

4.1 Off-Site

4.1.1 North Boundary

Samples analyzed for PCBs north of the site consisted of 45 samples, three of which showed evidence of PCB contamination. The three samples that were positive were collected from the ditch between the site and the railroad. These samples, which were collected during the initial site investigation, showed levels of PCBs, as Aroclor 1248, at 550 ppm, 4,000 ppm, and 8,000 ppm. They were the only samples collected during the investigation that showed significant levels of Aroclor 1248. Other samples collected subsequent to these, both upstream and downstream within the ditch, were reported by the laboratory to be non-detectable due to interference at a detection limit of 100 ppm. The interference may have been caused by the historic discharge of oily wastes, and the proximity of the ditch to the railroad and creosote preservatives. Due to the high detection limit, sediments in and around the highly contaminated area were removed and stabilized on-site.

Samples were collected along the north perimeter, which included the area north of the railroad, and along the ridge inside the site fence, after the excavation of the highly contaminated areas. The results of these samples did not indicate the presence of PCBs above the detection limit.

4.1.2 West Boundary

Sampling in the western area consisted mainly of samples collected around the Hamlin Steel Products facility. The area sampled also extended west along the railroad ditch adjacent to Hamlin Steel property. Nineteen samples were collected in this area with only one sample indicating the presence of PCBs. This positive sample indicated 850 ppm of PCBs in the area of the corrugated pipe, immediately north of the concrete pad adjacent to Hamlin Steel's building. Subsequent sampling of this area and the soils immediately inside the site fence 2 ft away failed to discover additional contamination at a detection level of 1 ppm.

4.1.3 East Boundary

PCBs were detected in three samples located between the site fence and an area 25 ft east of the fence, which was covered with metal debris from a removed transformer.

Two samples from an area over a storm drain pipe east of the apartment building south of the site, which had received fill material, detected PCB levels at less than 5 ppm. The remaining

WESTON • SPER River Center, 111 North Canal Street, 8th Floor, Suite 855,
Chicago, IL 60606 • (312) 993-1067

TECHNICAL ASSISTANCE TEAM FOR EMERGENCY RESPONSE REMOVAL AND PREVENTION
EPA CONTRACT 68-01-7367

Mr. Steven J. Faryan
Deputy Project Officer
Emergency Response Section
Western Response Unit
U.S. Environmental Protection Agency
11th Floor
230 South Dearborn Street
Chicago, Illinois 60604

April 5, 1988

TAT-05-G2-00350

Re: Summit Equipment and Supplies, Akron, Ohio
TDD# 5-8703-15

Dear Mr. Faryan:

The U.S. Environmental Protection Agency (U.S. EPA) tasked the Technical Assistance Team (TAT) on March 19, 1987, to conduct an extent of contamination study at the Summit Equipment and Supplies site, in conjunction with the On-Scene Coordinator support (TDD# 5-8703-14). The attached study presents the TAT's findings including analytical results, maps, and recommendations.

Should you have any questions or require additional information, please feel free to contact us.

Very truly yours,

ROY F. WESTON, INC.

Sally Matz

For Scott D. Springer
Technical Assistance Team
Leader, Region V

SDS/ljs

Attachment

areas (banks of Kohler ditch, the trace of the ditch along the railroad track east of the site, foot paths, and an old drainage swale in the peat bog), when sampled tested negative at the detection limit of 1 ppm.

4.1.4 Support Area

Twenty-five samples were collected from the support area. The samples were composited in order to cover a greater area, or to acquire enough quantity for analysis (Table 3). Twelve of the samples contained detectable levels of PCBs. Three of the positive samples were at levels of 10 ppm or greater, but no sample in this area was greater than 16 ppm. The PCBs in this area appeared to have been transported off-site via automobile traffic, as all the positive samples were from roadways, parking areas or vehicle access points to the site. Samples which proved non-contaminated included residential tree lawns, catch basins on Ivor Avenue, and foot paths along the perimeter.

4.1.5 Castle Apartment Field

The sampling conducted in this portion of the investigation included all samples collected south of the eastern portion of the site on Castle Apartment property. Thirty samples were collected in the first phase of sampling in this area (Figure 4). Of the 30, 17 samples tested positive for PCBs - ranging from 1 ppm to 75 ppm. Based on a removal action level of 10 ppm for PCBs in soils, an area was delineated for excavation. The removal area extended approximately 100 ft south of the site fence and paralleled the fence, extending approximately 240 ft east from the western property line of Castle Apartments. All soils excavated from off-site areas were staged on-site.

Post-removal samples revealed levels of up to 86 ppm, which necessitated further excavation. Sampling after this second removal again revealed detectable levels of PCB contamination, though levels below 20 ppm were encountered.

Interviews with the property owner and his excavation contractor revealed that the field had at one time a deep erosion gully leading through it, originating on the SES property. This erosion feature had been graded and backfilled during landscaping of the field so that all visible evidence of its presence was gone. The existence of this erosional feature was evident though, as excavation and sampling revealed PCBs up to 2,900 ppm at depths of 3 ft beneath the original sampling grade. PCBs were commonly found at levels above 50 ppm during continued excavation of the area in which the gully had been located.

TABLE 3

ANALYTICAL RESULTS - SUPPORT AREA*
TAT EXTENT-OF-CONTAMINATION
SUMMIT EQUIPMENT AND SUPPLIES
AKRON, OHIO

LOCATION	PCB LEVEL (ppm)	SAMPLE TYPE
SES DRIVEWAY	9	COMPOSITE
E. END - IVOR CATCH BASIN	ND	GRAB
S. SIDE - IVOR CATCH BASIN	2	GRAB
S. SIDE - IVOR FREE LAWN	ND	GRAB
DUPLICATE (TREE LAWN)	ND	GRAB
PIKE E. & IVOR CATCH BASIN	ND	GRAB
N. IVOR - TREE LAWN	ND	GRAB
NORTH IVOR CURB DEBRIS	3	GRAB
AUXILIARY ACCESS ROAD	ND	COMPOSITE
ACCESS ROAD GATEWAY	1	COMPOSITE
DUPLICATE (ACCESS GATE)	4	COMPOSITE
50 FT. EAST OF GATE	ND	COMPOSITE
N.E. CORNER OF FIELD	1	COMPOSITE
FOOTPATH SOUTH	ND	COMPOSITE
S. IVOR TREE LAWN	ND	COMPOSITE
E. PORTION IVOR	4	COMPOSITE
CENTER PORTION IVOR	10	COMPOSITE
W. PORTION IVOR	1	COMPOSITE
N. TREE LAWN IVOR	4	COMPOSITE
N.E. CORNER FIELD	ND	GRAB
DUPLICATE - N.E. FIELD	ND	GRAB
FENCELINE AT POLE	ND	GRAB
S.E. CORNER FIELD	ND	GRAB
PARKING AREA	16	COMPOSITE
875 IVOR - STREET	5	COMPOSITE

ND = Not Detected.
*Samples analyzed by Wadsworth Labs.

Test pits in the excavated area revealed little to no contamination at depths of 3 ft below the excavated grade (6 ft below original grade) (Table 4 and Figure 4A). Sixteen sample excavations were installed south and west of the area that had showed contamination. These excavations extended 3 ft deep, with each pit sampled at depths of 1 and 3 ft. This sampling revealed only one positive result (<10 ppm), at a depth of 1 ft from excavation number four. The lack of contamination in these pits substantiates the hypothesis that a channel carried PCB-contaminated liquid from the site.

The final sampling of the old channel area, after approximately 60 cubic yards of material had been removed, revealed levels of PCBs up to 25 ppm remaining. This area was backfilled and graded with a clean material.

It is believed, based on historical information and the results of the sampling effort, that the soil beneath the old channel was the only portion of the field that contained PCBs in levels greater that 10 ppm.

4.1.6 Lake Nesmith Beach

The Lake Nesmith Beach sampling consisted of four phases, with each of the first three phases successively moving east from the western corner of the beach to the eastern end. Sampling was initiated at the western end of the beach because this area was believed to have received the majority of the PCB-contaminated fill material; several small areas near the center of the beach also received fill material.

The first phase, consisting of 31 samples, was conducted in the western third of the beach. Twenty-three of the samples tested positive for PCBs (Table 5), with the highest being 28 ppm.

The second phase continued west after the results were received on the first phase. This phase consisted of 24 samples collected at 33 ft intervals from the eastern-most point of phase one to the eastern end of the beach. Only four samples, which were in the middle third of the beach, had detectable levels of PCBs (<5 ppm).

The third phase consisted of 12 samples, which were spaced between the second phase samples in the center third of the beach, and 3 additional samples in the eastern third. No PCBs were detected in the eastern third of the beach, while six of the samples in the center third indicated PCBs at levels less than 7 ppm (Figure 5).

The beach was subsequently excavated to a 1 ft depth over its entire western two-thirds, with the material being placed on

TABLE 4

ANALYTICAL RESULTS - OFF-SITE TEST PITS*
TAT EXTENT OF CONTAMINATION
SUMMIT EQUIPMENT AND SUPPLIES
AKRON, OHIO

TEST PIT NUMBER	DEPTH (Ft.)	PCB CONCENTRATION (ppm) AROCLOR 1260
4	1.0	60
4	2.0	ND
4	3.0	ND
4	5.0	ND
5	1.0	ND
5	2.0	ND
5	3.0	ND
5	5.0	ND
6	1.0	ND
6	2.0	ND
6	3.0	ND
6	4.0	ND
7	1.0	2
7	2.0	ND
7	3.0	ND
7	4.0	ND

ND = Not Detected.
*Samples analyzed by Wadsworth Labs.

TABLE 5

ANALYTICAL RESULTS - LAKE NESMITH BEACH PCB SAMPLES*
TAT EXTENT OF CONTAMINATION
SUMMIT EQUIPMENT AND SUPPLIES
AKRON, OHIO

SAMPLE NO.	PCB CONCENTRATION (PPM)	INVESTIGATIVE PHASE	SAMPLE NO.	PCB CONCENTRATION (PPM)	INVESTIGATIVE PHASE
B-1	28	I	B-36	ND	II
B-2	10	I	B-37	2	II
B-3	27	I	B-38	ND	II
B-4	7	I	B-39	ND	II
B-5	11	I	B-40	3	II
B-6	13	I	B-41	ND	II
B-7	ND	I	B-42	ND	II
B-8	8	I	B-43	ND	II
B-9	10	I	B-44	ND	II
B-10	20	I	B-45	ND	II
B-11	ND	I	B-46	ND	II
B-12	8	I	B-47	ND	II
B-13	9	I	B-48	ND	II
B-14	12	I	B-49	ND	II
B-15	15	I	B-50	ND	II
B-16	ND	I	B-51	ND	II
B-17	ND	I	B-52	ND	II
B-18	7	I	B-53	ND	II
B-19	6	I	B-54	ND	II
B-20	10	I	B-55	ND	II
B-21	ND	I	B-57	ND	III
B-22	10	I	B-60	ND	III
B-23	9	I	B-63	ND	III
B-24	4	I	B-66	ND	III
B-25	3	I	B-67	ND	III
B-26	10	I	B-68	5	III
B-27	8	I	B-69	ND	III
B-28	7	I	B-70	6	III
B-29	ND	I	B-71	4	III
B-30	ND	I	B-72	6	III
B-31	ND	I	B-73	4	III
B-32	3	II	B-74	ND	III
B-33	1	II	B-75	7	III
B-34	ND	II	B-76	4	III
B-35	2	II	B-78	3	III

ND = Not Detected.
*Samples analyzed by Wadsworth Labs.

TABLE 4

ANALYTICAL RESULTS - OFF-SITE TEST PITS*
TAT EXTENT OF CONTAMINATION
SUMMIT EQUIPMENT AND SUPPLIES
AKRON, OHIO

TEST PIT NUMBER	DEPTH (Ft.)	PCB CONCENTRATION (ppm) AROCLOR 1260
4	1.0	60
4	2.0	ND
4	3.0	ND
4	5.0	ND
5	1.0	ND
5	2.0	ND
5	3.0	ND
5	5.0	ND
6	1.0	ND
6	2.0	ND
6	3.0	ND
6	4.0	ND
7	1.0	2
7	2.0	ND
7	3.0	ND
7	4.0	ND

ND = Not Detected.
*Samples analyzed by Wadsworth Labs.

TABLE 5

ANALYTICAL RESULTS - LAKE NESMITH BEACH PCB SAMPLES*
TAT EXTENT OF CONTAMINATION
SUMMIT EQUIPMENT AND SUPPLIES
AKRON, OHIO

SAMPLE NO.	PCB CONCENTRATION (PPM)	INVESTIGATIVE PHASE	SAMPLE NO.	PCB CONCENTRATION (PPM)	INVESTIGATIVE PHASE
B-1	28	I	B-36	ND	II
B-2	10	I	B-37	2	II
B-3	27	I	B-38	ND	II
B-4	7	I	B-39	ND	II
B-5	11	I	B-40	3	II
B-6	13	I	B-41	ND	II
B-7	ND	I	B-42	ND	II
B-8	8	I	B-43	ND	II
B-9	10	I	B-44	ND	II
B-10	20	I	B-45	ND	II
B-11	ND	I	B-46	ND	II
B-12	8	I	B-47	ND	II
B-13	9	I	B-48	ND	II
B-14	12	I	B-49	ND	II
B-15	15	I	B-50	ND	II
B-16	ND	I	B-51	ND	II
B-17	ND	I	B-52	ND	II
B-18	7	I	B-53	ND	II
B-19	6	I	B-54	ND	II
B-20	10	I	B-55	ND	II
B-21	ND	I	B-57	ND	III
B-22	10	I	B-60	ND	III
B-23	9	I	B-63	ND	III
B-24	4	I	B-66	ND	III
B-25	3	I	B-67	ND	III
B-26	10	I	B-68	5	III
B-27	8	I	B-69	ND	III
B-28	7	I	B-70	6	III
B-29	ND	I	B-71	4	III
B-30	ND	I	B-72	6	III
B-31	ND	I	B-73	4	III
B-32	3	II	B-74	ND	III
B-33	1	II	B-75	7	III
B-34	ND	II	B-76	4	III
B-35	2	II	B-78	3	III

ND = Not Detected.
*Samples analyzed by Wadsworth Labs.

site. The post-excavation samples over this area were spaced over the entire length of the excavated area and collected in areas that were expected to receive PCB-contaminated fill material. Eight samples were collected in the post-excavation sampling phase, with one sample indicating PCBs at 1 ppm. The remaining PCB-contaminated area was located around a roof drain pipe leading to the water, and was subsequently excavated.

Based on the available analytical data and the information provided on the backfill of the beach, it is believed that PCBs had not migrated deeper than 12 inches on the beach. The removal of 12 inches of sand over the majority of the beach and up to 2 ft of sand at the western end was deemed to be adequate to remove the low levels of PCB-contaminated material.

4.1.7 Lake Nesmith Sediments

Because of the discovery of PCB contamination along the south shore beach of Lake Nesmith, the sampling of near shore sediments was conducted to determine if PCB-contaminated sands had migrated from the beach to the water. Twenty-four sediment samples were collected along the south shore of Lake Nesmith, seven of which contained detectable levels of PCBs (Figure 6). No removal was initiated because the PCB contamination was limited to 3 ppm or less, and the sediments were randomly distributed along the shore.

Three samples of 15 to 20 ft depth sediments were collected for PCB analysis within Lake Nesmith. No PCBs were detected in these samples (Figure 7).

4.1.8 Lake Nesmith Surface Water

The water samples collected from Lake Nesmith for PCB analysis were collected off-shore of the contaminated portion of the beach. Four of the five samples indicated PCBs above the detection limit of 0.5 parts per billion (ppb), with results ranging from 0.8 ppb to 2.4 ppb (Figure 8). The method of collection for these five samples allowed for sediment to be collected with each sample, it is believed that contamination levels noted were from PCB-contaminated sediments suspended in the water sample. The sixth sample collected from a rowboat contained no detectable levels of PCBs. No further action was taken on the presence of PCBs in the wading zone off the south shore of Lake Nesmith.

4.1.9 Air Samples

Results of air sampling along the perimeter of the SES site is summarized in Table 6 and represents the total amount of PCBs detected in 480 liters of air, with a detection limit of 0.04 ug. Of the 35 "actively" collected samples, 8 were found positive for PCBs.

Detectable levels of PCBs were observed most frequently from the station on the tree at the northeast perimeter; PCBs were detected five out of the seven days monitored, with particulate PCBs being present on four of these occasions. Particulate PCB concentrations exhibited the greatest range at this station; the lowest level recorded was the detection limit of 0.04 ug and the highest level was 0.07 ug. This station was also the only location where volatile PCBs were detected. Two samples tested positively for volatile PCBs, but only one of the positive volatile samples occurred simultaneously with a positive particulate sample.

The station at the tree at the Castle Apartment field excavation recorded two samples with detectable levels of PCBs (0.06 ug and 0.07 ug). The other station to record a positive result was the western station at the Hamlin Steel fence. It coincided with positive results observed at the northeast tree station and the excavation station. The results may be attributed to dry conditions with an almost steady wind from the north, a condition which was not duplicated during any other sampling event.

No PCBs were detected at the stations along Ivor Avenue. The pattern of positive results can most likely be attributed to the proximity of the stations to a source of PCBs. The northeast tree was 3 ft from the site fence near a location of documented high soil contamination, the excavation station was largely surrounded by PCB-contaminated soils, and the Hamlin Steel station was located on the site fence.

The action level for ambient air was established as 0.001 mg/m^3 which is the National Institute of Occupational Safety and Health (NIOSH) Permissible Exposure Limit. The results of the 7-day sampling effort indicated levels of PCBs in the air an order of magnitude below this action level.

4.2 On-Site

4.2.1 Soil

4.2.1.1 Surface - PCBs

The SES site was sampled extensively for the presence of PCBs in the surface soils.

TABLE 6

ANALYTICAL RESULTS - PCB AIR MONITORING, MAY 1987
TAT EXTENT OF CONTAMINATION
SUMMIT EQUIPMENT AND SUPPLIES
AKRON, OHIO

Location	Analysis	PCB Concentration (ug)						
		May 05	May 06	May 08	May 11	May 12	May 13	May 15
Hamlin Steel Fence	Particulate	ND	ND	ND	ND	0.06	ND	ND
	Volatile	ND	ND	ND	ND	ND	ND	ND
West Pole at Ivor Avenue	Particulate	ND*	ND	ND	ND	ND	ND	ND
	Volatile	ND*	ND	ND	ND	ND	ND	ND
East Pole at Ivor Avenue	Particulate	ND	ND	ND	ND	ND	ND	ND
	Volatile	ND	ND	ND	ND	ND	ND	ND
Tree at Excavation	Particulate	ND	0.06	ND	ND	0.07	ND	ND
	Volatile	ND	ND	ND	ND	ND	ND	ND
Northeast Tree	Particulate	ND	0.06	0.04	ND	0.06	0.07	ND
	Volatile	ND	0.06	ND	0.05	ND	ND	ND
Field Blank	Particulate	ND	ND	ND	ND	ND	ND	ND
	Volatile	ND	ND	ND	ND	ND	ND	ND

Air monitoring samples collected for 8-hours by Gillian pumps at a rate of 1 liter/minute (480 liters/day/sample) onto glass fiber filters or florisil tubes. Samples were analyzed by Wadsworth/Alert Laboratories, Wadsworth, Ohio.

ND = Not Detectable (Detection Limit = 0.04 ug)

The OEPA had previously collected five soil samples from on site, with levels of PCBs detected ranging from 180 ppm to 74,000 ppm. The initial eight samples collected on-site by the TAT indicated levels of PCBs ranging from not detectable to 1,350 ppm.

The 127 ensuing samples collected during the EOC study (Table 7) indicated that the soils on-site at SES were extensively contaminated by PCBs. Of the samples analyzed during the extent of contamination study, 53 were found to contain PCBs at 50 ppm or greater; 43 of these were greater than 100 ppm. Eighteen samples had concentrations of PCBs greater than 500 ppm; 12 of these exceeded 1,000 ppm, and 6 of the 12 exceeded 10,000. Only six samples collected on-site did not show detectable levels of PCBs. The TSCA policy on PCBs establishes a level of 25 ppm for cleanup in soils though U.S. EPA can impose stricter levels if a threat to ground water is perceived.

Samples were collected with fairly uniform frequency across the site. Sample locations were dictated by access to the soil; most of the samples were collected along the edges of open roadways and in open work areas. As the majority of the site consists of metal scrap and debris piles which cover and minimize access to the soil, no accurate estimate of the extent of surface contamination can be made until the soils beneath the scrap piles can be investigated further. Given the characteristics of the past operations on-site and the typical soil conditions, it can be assumed that PCB contamination in the soil is not limited to only the open areas on site.

The highest concentration of PCBs in soils may have come from the leakage of capacitor fluids from electrical equipment observed throughout the site. The majority of the PCB contamination can be attributed to transformer spills and tracking of materials through spill areas which expanded the aerial extent. During the removal action, approximately 300 capacitors and 1,300 transformer carcasses were removed from the site. Additional transformers and capacitors will most likely be discovered on-site when the metal scrap and debris are removed.

The possibility for additional migration of contaminants is increased after the scrap and debris are removed and the soil is exposed. PCB-contaminated soils may be easily transported across the site because of the sandy consistency of the soils, which supports very little vegetation. Because site soils consisted of homogenous sands, it was difficult to differentiate freshly excavated soil from soil which had been in place indefinitely.

TABLE 7

ANALYTICAL RESULTS - ON-SITE SURFACE SOIL PCB SAMPLES*
TAT EXTENT OF CONTAMINATION
SUMMIT EQUIPMENT AND SUPPLIES
AKRON, OHIO

DATE COLLECT	SAMPLE NUMBER	PROJECT NUMBER	LOCATION	AROCLOR-LEVEL	UNITS	DETECTION LIMIT
4/11/87	S-50	87CY06	P-5, 8-A	1260-570	ppm	60
"	S-51	"	P-3, 8-I	1260-600	ppm	60
"	S-52	"	P-2, 9-C	1260-9	"	1
"	S-53	"	L-3, 11-C	1254-3	"	1
"	S-54	"	L-8, 10-H	1254-28	"	5
"	S-55	"	M-1, 11	1260-12	"	2
4/11/87	S-56	87CY06	M-5, 10-I	1254-170	ppm	20
"	S-57	"	N-6, 9-A	1260-1	"	1
"	S-58	"	N-7, 9-C	1260-25	"	3
"	S-59	"	O-3, 9-F	1260-180	"	20
"	S-60	"	P-5, 10-F	ND	"	1
4/11/87	S-61	87CY06	Q-7, 10-E	ND	ppm	1
"	S-62	"	Q-8, 9-D	1260-2	"	1
"	S-63	"	P-4, 7	ND	"	1
"	S-64	"	P-5, 6-H	1260-5	"	1
"	S-65	"	P-3, 7-D	ND	"	1
4/11/87	S-66	87CY06	P-2, P-2	1260-1	ppm	1
"	S-67	"	O-4, 7-B	1260-13	"	2
"	S-68	"	O-7, 6-F	1260-4	"	1
"	S-69	"	O-3, 6-H	1260-11	"	2
"	S-70	"	O-1, 6-F	1260-3	"	1
4/11/87	S-71	87CY06	O, 6-I	1260-3	ppm	1
"	S-72	"	N, 9-A	1260-2	"	1
"	S-73	"	N-7, 9-H	1260-190	"	20
"	S-74	"	N-3, 7-I	1260-8	"	1
"	S-75	"	N-1, 6-I	1260-11000	"	1000
4/11/87	S-76	87CY06	M-8, 5-I	1260-240	ppm	25
"	S-77	"	M-8, 5-G	1260-29000	"	3000
"	S-78	"	M-4, 5-H	1254-78000	"	10000
"	S-79	"	M-6, 5-D	1260-1200	"	150
"	S-80	"	N-1, 4-F	1242-280	"	10*

TABLE 7 (CONTINUED)

DATE COLLECT	SAMPLE NUMBER	PROJECT NUMBER	LOCATION	AROCLOR-LEVEL	UNITS	DETECTION LIMIT
4/11/87	S-81	87CY06	M-7, 4-C	1260-43	ppm	5
"	S-82	"	M-2, 4-F	1260-240	"	25
"	S-83	"	L-6, 4-A	1260-560	"	10
"	S-84	"	M-4, 5-A	1260-240	"	25
"	S-85	"	L-1, 3-F	1260-16000	"	2000
4/11/87	S-86	87CY06	L-4, 3-C	1260-6	ppm	1
"	S-87	"	K-2, 2-H	1260-1100	"	100
"	S-88	"	K-2, 2-A	1260-22	"	2
"	S-89	"	Dup of S-88	1260-40	"	5
"	S-90	"	T-9, 3-F	1260-10000	"	1000
4/11/87	S-91	87CY06	I-4, 9-F	1260-1800	ppm	200
"	S-92	"	I-4, 3-D	1260-900	"	100
"	S-93	"	Dup of S-92	1260-1800	"	200
"	S-94	"	I-5, 3-B	1260-3000	"	300
"	S-95	"	H-6, 3-H	1260-500	"	50
4/11/87	S-96	87CY06	J-7, 4-H	1260-100	ppm	10
"	S-97	"	I-2, 4-H	1260-200	"	20
"	S-98	"	I-4, 4-H	1260-500	"	50
"	S-99	"	I-5, 4-H	1260-250	"	25
4/11/87	S-01	87CY11	H-7, 4-C	ND	ppm	1
"	S-02	"	H-6, 4-F	1248-4	"	2
"	S-03	"	H-7, 4-H	1260-14	"	1
"	S-04	"	Dup of S-03	1260-22	"	3
"	S-05	"	H-8, 4-I	1260-83	"	10
4/11/87	S-06	87CY11	G-7, 5-D	1260-21	ppm	15
"	S-07	"	F-7, 5-B	1260-180	"	20
"	S-08	"	G-2, 4-H	1260-21	"	2
"	S-09	"	I-7, 5-H	1260-13	"	1
"	S-10	"	Dup of S-09	1260-12	"	1
4/12/87	S-11	87CY11	K-7, 11-H	1248-11	ppm	5
				1260-12	"	5
"	S-12	"	K-9, 11-A	1248-4	"	2
				1260-18	"	2
"	S-13	"	Dup of S-12	1260-18	"	2
"	S-14	"	L , 10-I	1248-2	"	2
				1260-10	"	5
"	S-15	"	K-9, 10-G	1260-28	"	5
				1248-4	"	2

TABLE 7 (CONTINUED)

DATE COLLECT	SAMPLE NUMBER	PROJECT NUMBER	LOCATION	AROCLOR-LEVEL	UNITS	DETECTION LIMIT
4/12/87	S-16	87CY11	K-9, 9-A	1248-4	ppm	2
				1260-11	"	2
"	S-17	"	K-9, 7-H	1248-12	"	5
				1260-34	"	5
"	S-18	"	K-6, 7	1260-25	"	5
"	S-19	"	L-2, 7-D	1260-180	"	20
"	S-20	"	L-1, 6-B	1260-1	"	1
4/12/87	S-21	87CY11	K-3, 6-A	1248-60	ppm	10
				1260-100	"	10
"	S-22	"	K-1, 6-B	1254-23	"	3
"	S-23	"	J , 5-I	1260-60	"	5
"	S-24	"	J-7, 6	1260-6	"	1
"	S-25	"	Dup of S-23	1260-50	"	5
4/12/87	S-26	87CY11	I-5, 6-B	1260-30	ppm	3
"	S-27	"	I-8, 5	1248-200	"	100
				1260-380	"	100
"	S-28	"	H-2, 4-A	1260-18	"	5
"	S-29	"	H , 3-I	1260-36	"	5
"	S-30	"	G-6, 3-E	1260-53	"	10
4/12/87	S-31	87CY11	H-2, 3-B	1260-140	ppm	20
"	S-32	"	C , 6-E	1260-180	"	20
"	S-33	"	B-8, 6-E	1260-480	"	100
"	S-34	"	B-6, 6-F	1260-120	"	15
"	S-35	"	B-4, 6-F	1260-160	"	50
4/12/87	S-36	87CY11	B-4, 6-C	1260-20000	ppm	5000
"	S-37	"	B-1, 6-C	1260-55	"	5
4/13/87	S-38	"	F-8, 4-E	1260-70	"	7
"	S-39	"	Dup of S-38	1260-70	"	7
"	S-40	"	F-1, 4-G	1260-50	"	5
4/13/87	S-41	87CY11	H , 3-G	1260-120	ppm	15
"	S-42	"	H-5, 3-E	1260-120	"	15
"	S-43	"	E-8, 4-I	1260-25	"	3
"	S-44	"	B-7, 6-B	1260-30	"	3
"	S-45	"	C-5, 5-I	1260-9	"	1
4/13/87	S-46	87CY11	D-2, 5-I	1260-18	ppm	2
"	S-47	"	D-7, 5-G	1260-100	"	10
"	S-48	"	E-1, 5-C	1260-10	"	1
"	S-49	"	Dup of S-48	1260-13	"	1
"	S-50	"	E-6, 5-A	1260-16	"	2

TABLE 7 (CONTINUED)

DATE COLLECT	SAMPLE NUMBER	PROJECT NUMBER	LOCATION	AROCLOR-LEVEL	UNITS	DETECTION LIMIT
4/13/87	S-51	87CY11	E-5, 5-D	1260-8	ppm	1
"	S-52	"	E-8, 5-B	1260-15	"	2
4/20/87	S-58	"	D , 6-F	1260-4	"	1
"	S-59	"	D-7, 6-G	1260-16	"	2
"	S-60	"	E-3, 6-D	1260-30	"	5
4/20/87	S-61	87CY11	Dup of S-59	1260-15	ppm	2
"	S-62	"	F , 6-F	1260-15	"	1
"	S-63	"	F-9, 7-A	1260-19	"	5
"	S-64	"	F-2, 6-H	1260-6	"	1
"	S-65	"	F-5, 6-I	1260-16	"	2
4/20/87	S-66	87CY11	G , 6-F	1260-2	ppm	1
"	S-67	"	F-4, 6-A	1260-33	"	15
"	S-68	"	G-3, 6-A	1260-2	"	1
"	S-69	"	H-9, 6-G	1260-52	"	25
"	S-70	"	H-6, 6-B	1260-120	"	60
4/20/87	S-71	87CY11	G-8, 6-E	1260-19	ppm	5
"	S-72	"	G , 6-B	1260-12	"	5
"	S-73	"	Dup of S-71	1260-28	"	10
"	S-74	"	G-6, 5-E	1260-3	"	1
"	S-75	"	H-2, 5-E	ND	"	1
4/20/87	S-76	87CY11	J-7, 5-C	1260-190	ppm	50
"	S-77	"	K-4, 5-A	1260-47	"	25
"	S-78	"	J-8, 3-H	1260-2500	"	1000
"	S-79	"	J-3, 3-D	1260-300	"	50
"	S-80	"	J-2, I-G	1260-33	"	25
4/20/87	S-81	87CY11	K , I-D	1260-3	ppm	2

ND = Not Detected.
*Samples analyzed by Wadsworth Labs.

4.2.1.2 Subsurface - PCB

Test pits were employed to investigate the potential of PCB contamination at depths.

Seven test pits were excavated in areas where surface sampling had indicated soils were highly contaminated or in areas where there appeared to be evidence of transformer salvaging without high surface contamination (Figure 14). As can be seen from Table 8, PCB contamination has been detected up to 3.0 ft beneath the SES site. Test Pit 2 and Test Pit 11 indicated PCB contamination increasing with depth though not exceeding levels which had been detected at the surface in these areas. Test Pit 8 was the only location to yield samples which were not contaminated with PCBs. Each of the other six test pits indicated some PCB contamination at depth. It is expected that soil contamination may be extensive at depths to 3 ft in other areas of the site where transformers were opened, because of the highly permeable sandy soil.

The borings which were performed for the ground water investigation were sampled for the presence of PCBs at depth. The initial sites of these borings were chosen to be proximal to the downgradient perimeter and in area of low surface contamination (Figure 14). The samples collected from the borings did not indicate PCBs at any depth greater than 2.5 ft (Table 9). Because the borings were installed in fairly clean areas, the available borings were not analyzed for their entire length. The analytical results indicate that the PCB contamination has not migrated off the site laterally at a depth below 3 ft.

4.2.1.3 Surface Priority Pollutant Metals

Ten samples were collected in the EOC study to be analyzed for total Priority Pollutant metals (Figure 15). These samples were essential to characterize the site in regard to other contaminants besides PCBs. The levels of total metals across the site were elevated with respect to a background sample (S42) collected 300 yards off-site. This elevation in total metal content can be anticipated due to the natural weathering of the metals concentrated on-site. A breakdown of the occurrence of the 13 heavy metals analyzed at the SES site can be found in Table 10. When compared to levels typically occurring in U.S. soils (U.S. EPA, 1986), only the following metals are significant.

Cadmium

The background sample indicated cadmium was present off site at 10.6 ppm. On-site soils ranged from 3.95 ppm to 55.5 ppm. The typical concentration according to U.S. EPA is 0.06 ppm with a common range of 0.01 to 0.7 ppm. The samples on site indicate

TABLE 8

ANALYTICAL RESULTS - ON-SITE TEST PITS FOR PCBS*
TAT EXTENT OF CONTAMINATION
SUMMIT EQUIPMENT AND SUPPLIES
AKRON, OHIO

TEST PIT NUMBER	DEPTH (Ft.)	PCB CONCENTRATION (ppm) AROCLOR 1260
1	0.5	140
1	1.0	ND
1	2.0	ND
1	4.0	ND
2	0.5	2600
2	1.0	3100
2	2.0	4900
2	4.0	ND
3	0.5	3
3	1.0	2
3	2.0	ND
3	4.0	ND
8	1.0	ND
8	2.0	ND
8	3.0	ND
9	1.0	170
9	2.0	ND
9	3.0	ND
10	1.0	140
10	2.0	23
10	3.0	ND
11	1.0	1000
11	2.0	2100
11	3.0	2300

ND = Not Detected.
*Samples analyzed by Wadsworth Labs.

TABLE 9

ANALYTICAL RESULTS - SOIL BORING ANALYSIS FOR PCBs*
TAT EXTENT OF CONTAMINATION
SUMMIT EQUIPMENT AND SUPPLIES
AKRON, OHIO

BORING #	DEPTH (ft) BELOW GRADE	CONCENTRATIONS OF PCBs (ppm)
1	2.5	1
1	10.5	ND
1	19.5	ND
2	1.5	ND
2	6.0	ND
2	9.0	ND
3	1.5	49
3	6.0	ND
3	12.0	ND
3	15.0	ND

ND = Not Detected.
*Samples analyzed by Wadsworth Labs.

TABLE 10

ANALYTICAL RESULTS - PRIORITY POLLUTANT METALS (TOTAL)*
TAT EXTENT OF CONTAMINATION
SUMMIT EQUIPMENT AND SUPPLIES
AKRON, OHIO

PARAMETER	SAMPLE NUMBER									
(ppm)	S-33	S-34	S-35	S-36	S-37	S-38	S-39	S-40	S-41	S-42**
Antimony	ND	ND	5.5	3.0	ND	ND	1.0	ND	ND	ND
Arsenic	14.2	11.1	22.2	1.03	8.03	11.5	5.35	9.47	7.61	0.62
Beryllium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	4.3	16.2	9.45	35.9	16.5	22.6	55.5	3.95	16.6	10.6
Chromium	141.0	67.0	52.0	86.0	271.	301	254	28.7	39.9	10.6
Copper	262.0	333.0	5250.0	36,200.0	129.0	458.0	1,050.0	183.0	385.0	8.6
Lead	240.0	39,000.0	64,000.0	1,065.0	91.5	409.0	1,650.0	324.0	2,045.0	6.5
Mercury	0.32	0.37	1.89	3.50	4.61	4.37	3.98	0.75	0.30	0.40
Nickel	14.0	365.0	95.0	90.0	155.0	75.0	115	30.0	430	2.0
Silver	1.40	1.05	7.75	3.95	16.0	0.75	3.90	1.15	0.70	ND
Thallium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	489.0	705.0	2,240.0	2,990.0	1,170.0	115,000.0	6,600.0	2,880.0	680.0	21.7

ND = Not Detected.
*Samples analyzed by Aqualab.
**Background sample collected of similar soils off-site.
All Selenium values were ND.

that there are portions of the site which have elevated concentrations of cadmium.

Copper

The background sample contained 8.6 ppm copper. The maximum concentration for copper on-site exceeds 36,000 ppm for sample S - 36. Samples on site ranged from 129 ppm to 36,200 ppm. The U.S. EPA gives a common range of 2 to 100 ppm, a range which is exceeded by all of the samples collected on site. Given the background sample, it can be deducted that copper is a common contaminant on site, as a direct result of the site activities.

Lead

Lead was determined to be present in the background sample at 5.5 ppm, four orders of magnitude less than the highest result for lead obtained on site. The concentration of lead in samples obtained on site range from 91.5 to 64,000 ppm. Only one sample falls within the common range given by the U.S. EPA as 2 to 200 ppm. The site exhibits an impact from past operations involving battery reclamation which may pose a threat to human health through inhalation or ingestion of lead particulates. Typically, lead contaminated soils greater the 500 ppm have been removed from sites.

Mercury

The background for mercury at the SES site was established at 0.40 ppm while the on-site concentrations ranged from 0.3 to 4.61 ppm. The U.S. EPA designated the eastern U.S. as having a mean value of 0.15 ppm while exhibiting a range of 0.01 to 4.6 for soils in the western U.S. It is not believed that the SES operation has created a significant impact on the levels of mercury found on the site.

Silver

In the background sample collected, silver was not detected above the detection limit of 0.05 ppm. The site held a range of concentrations from 0.70 to 16 ppm which exceeds the common range of 0.01 to 5 ppm (Lindsay, 1979). Only two of the nine samples collected were beyond the common range and do not appear to present a great anomaly.

Zinc

The background concentration of zinc was established to be 2.17 ppm. Each sample collected on-site had levels of zinc higher than background, with values ranging from 489 to 115,000 ppm. These values on-site may be attributed to the amount of galvan-

ized steel products on-site which have been weathered to form zinc oxides. The higher levels can be attributed to the battery reclamation areas.

Concentrations of heavy metals can be expected to vary across the SES site due in part to the activities which were conducted and to the decomposition of a varied collection of metals. As an example, the areas of battery reclamation exhibit the greatest amount of zinc while the areas surrounding the smelter contain extremely high concentrations of lead, and the wire stripping areas contains copper at levels of four times the magnitude of background samples.

4.2.1.4 Dioxin/Furan

Samples were collected for dioxin/furan analysis at four locations across the site due to the extensive presence of PCBs and the burning which took place on-site. The results are summarized in Tables 11, 12A, and 12B.

The initial (isomer specific 2,3,7,8-tetrachlorodibenzodioxin and tetrachlorodibenzofuran [TCDD/TCDF]) sample analyses, was performed by Hazelton Laboratories. The results indicated positive for 2,3,7,8-TCDD in the ash pile, Location S-18. Two locations, the burn barrel area (S-16) and the firebrick and debris area (S-19), were positive for 2,3,7,8-TCDF.

Subsequent re-analysis of the extract at TMS for the tetra through octa isomer classes of chlorinated dibenzodioxin and chlorinated dibenzofurans (CDD/CDF) and 2,3,7,8-TCDD/TCDF isomer specific, resulted positive for 2,3,7,8-TCDD in the burn barrel area and the firebrick debris pile. These results, reported as 1.0 and 1.1 ppb respectively, are the maximum 2,3,7,8-TCDD expected in the analysis with the column used. If analysis is performed with a longer polar capillary column, any value, including zero, below the reported value may be obtained from the extract. This allows for the possibility of three of the four samples having some quantity of 2,3,7,8-TCDD or just one. The one sample found positive for 2,3,7,8-TCDD by Hazelton Laboratories was below the detection limit of TMS' analysis.

The analysis performed by TMS also indicated the presence of isomer classes of CDD and CDF in the burn barrel area and the firebrick debris areas seen in Table 12B.

4.2.2 Ground Water - PCBs and Priority Pollutant Metal

Two sampling events of the wells installed at the SES site were performed for the EOC study. Both well sampling analyses indicated a slight PCB contamination of monitoring well 3 with a concentration of 3.8 ppb as shown in Table 13. Initial sampling of

TABLE 11

ANALYTICAL RESULTS - 2,3,7,8 DIOXIN/FURAN*
TAT EXTENT OF CONTAMINATION
SUMMIT EQUIPMENT AND SUPPLIES
AKRON, OHIO

LABORATORY	HAZELTON LABS		TMS ANALYTICAL
Sample Number	2,3,7,8 TCDF (ppb)	2,3,7,8 TCDD (ppb)	2,3,7,8 TCDD (ppb)
S-16	5.13	< 0.24	1.0**
S-17	< 0.14	< 0.24	< 0.5
S-18	< 0.10	0.38	< 1.2
S-19	0.14	< 0.19	1.1**

ND = Not Detected.
*Samples analyzed by Hazelton and TMS.
**This number is the maximum 2,3,7,8-TCDD to be expected under isomer specific analysis, any value including zero below this value may be present.

TABLE 12A

ANALYTICAL RESULTS - DIOXIN*
TAT EXTENT OF CONTAMINATION
SUMMIT EQUIPMENT AND SUPPLIES
AKRON, OHIO

SAMPLE NUMBER	LOCATION	DIBENZO-P-DIOXIN (PPB)				
		TCDD	PCDD	HXCDD	HPCDD	OCDD
S16	Burn Bbl. Area	< 40.6	< 1.6	< 0.6	1.3	< 2.6
S17	Incinerator	< 0.5	< 0.3	< 0.6	< 1.2	< 1.9
S18	Ash Pile	< 1.2	< 0.9	< 1.2	< 2.4	< 4.1
S19	Fire Brick/Debris	< 3.6	< 2.4	< 1.4	< 2.4	< 1.7

TABLE 12B

ANALYTICAL RESULTS - FURAN*
TAT EXTENT OF CONTAMINATION
SUMMIT EQUIPMENT AND SUPPLY
AKRON, OHIO

SAMPLE NUMBER	LOCATION	CHLORODIBENZOFURAN (PPB)				
		TCDF	PCDF	HXCDF	HPCDF	OCDF
S16	Burn Bbl. Area	8.5	17.2	6.3	10.5	14.9
S17	Incinerator	< 0.3	< 0.3	< 0.5	< 1.0	< 2.0
S18	Ash Pile	< 0.9	< 0.8	< 1.0	< 2.1	< 4.3
S19	Fire Brick/Debris	< 0.8	6.1	< 1.2	< 2.1	3.2

ND = Not Detected.

Detection Limit based on concentration of interfering compounds.

*Samples analyzed for isomer and cogener specific parameters at TMS from extractions performed at Hazelton Laboratories.

TABLE 13

ANALYTICAL RESULTS - GROUND WATER*
TAT EXTENT OF CONTAMINATION
SUMMIT EQUIPMENT AND SUPPLIES
AKRON, OHIO

PARAMETER	WELL NO.1	WELL NO.2	WELL NO.3	WELL NO.4	OFFICE WELL
PCB, 5-29-87 (ug/l)	ND	ND/0.5**	7.4	ND	ND
PCB, 7-17-87 (ug/l)	ND	ND	3.8	ND	ND
Antimony (mg/l)	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic (mg/l)	<0.001	<0.001	0.007	<0.001	<0.001
Beryllium (mg/l)	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium (mg/l)	<0.001	<0.001	0.022	<0.001	0.020
Chromium, Total (mg/l)	<0.001	<0.001	<0.001	<0.001	0.011
Copper (mg/l)	<0.001	<0.001	<0.001	<0.001	<0.001
Lead (mg/l)	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury (mg/l)	<0.001	<0.001	<0.0001	<0.0	<0.0001
Nickel (mg/l)	<0.01	<0.01	0.04	<0.01	0.05
Selenium (mg/l)	<0.001	<0.001	<0.001	<0.001	<0.0001
Silver (mg/l)	<0.001	<0.001	<0.001	<0.001	<0.001
Thallium (mg/l)	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc (mg/l)	0.016	0.015	0.033	0.025	0.222

*Samples analyzed by Wadsworth Labs.
**0.5 PCB was detected after the well was evacuated.
ND = Not detected at the specified detection limit of 0.5 ug/l.

monitoring well 2 indicated the presence of PCBs at the detection level of 0.5 ppb. This result was not duplicated in subsequent sampling. Monitoring well 3 was installed closest to a documented surface contaminated area and had concentrations of 49 ppm of PCBs detected 1.5 ft below grade during soil boring sample analysis. The contamination of 11.2 ppb which is present in monitoring well 3 may be the result of particles of PCB-contaminated sand entering the well and sample during collection of the sample.

Monitoring wells 1, 2 and 4 showed no impact from the 13 Priority Pollutant metals as indicated in Table 13. Levels of zinc were present in all of the samples at levels below the drinking water standard. Zinc was also observed in the sample field blank submitted with the samples. The office well and monitoring well 3 showed elevated levels of nickel and cadmium both surpassing the drinking water quality standards.

Arsenic was detected in monitoring well 3 at a level of 7 ppb, below the primary drinking water standard of 50 ppm. The office well contained 11 ppb of chromium, a level which is also below water quality standards of 50 ppb.

4.2.3 Swipe Samples - PCBs

Swipe samples were performed on metals throughout the SES site without any significant detection of PCBs. Twenty samples were collected from metal debris on-site. Seven of these samples were found positive for PCBs with all these results being less than 25 ug/wipe (Table 14).

Initially, swipe samples were collected of transformer carcasses to aid in the process of establishing disposal criteria. Sixteen samples collected from transformers of various makes and sizes to establish the contamination levels of the carcasses. These swipe samples indicated that the transformers were contaminated with up to 126,000 ug/100 cm^2 PCBs.

4.2.4 Oil Samples - PCBs

As the transformers on-site were being staged for disposal, those which contained fluids were sampled to determine which of the following waste systems to bulk the oil:

- Non-detectable levels of PCBs;
- Less than 50 ppm PCB;
- Greater than 50 ppm, but less than 500 ppm PCB; or,
- Greater than 500 ppm PCB.

TABLE 14

ANALYTICAL RESULTS - SWIPE ANALYSIS
ON METAL (100 cm^2) FOR PCBS*
TAT EXTENT OF CONTAMINATION
SUMMIT EQUIPMENT AND SUPPLIES
AKRON, OHIO

SAMPLE NO	CONCENTRATION ug/WIPE
W-1	ND
W-3	ND
W-7	2
W-8	ND
W-12	ND
W-14	ND
W-18	24
W-19	8
W-20	4
W-34	ND
SW-11	0.7
SW-12	ND
SW-13	ND
SW-14	0.8
SW-15	ND
SW-16	ND
SW-17	ND
SW-18	ND
SW-19	ND
SW-20	1.9

ND = Not Detected.
*Samples analyzed by Wadsworth Labs.

Fifty-two samples were collected from transformer liquids for disposal characterization of these liquids. Two samples of transformer fluids contained over 500 ppm, while two other transformers with fluids contained over 50 ppm but less than 500 ppm. Seventeen of the 52 transformers tested had detectable concentrations less than 50 ppm. The remaining 31 transformers had fluids or water which contained nondetectable concentrations of PCBs at a detection limit of 1 ppm.

4.3 Quality Assurance/Quality Control

All QA/QC procedures implemented at the SES site were carried out in accordance with the QA/QC plan for the site (Attachment F).

All laboratories utilized in the project were members of the National Contract Laboratory Program or are U.S. EPA approved for the specific analysis they performed.

5.0 RECOMMENDATIONS

Due to the extensive PCB contamination which has been documented at the SES site, it is essential that the total problems associated with the site be understood before further actions are undertaken. Threats posed by the site included the potential for airborne contaminant migration and the possibility of a deep migration of PCBs in the ground water beneath the site.

In order to mitigate the threats, more actions are required by the U.S. EPA. A Remedial Investigation/Feasibility Study (RI/FS) or Engineering Evaluation Cost Analysis (EECA) should be performed to document the most feasible alternative applicable to the site. Further actions without this documentation should be limited, and should be performed in accordance with objectives of the EECA or RI/FS in mind.

Technologies available for remediation of this site could include:

Category	Applicable Technology
Waste Destruction	Rotary Kiln, Infrared System. Circulating Bed Combustor. Advanced Electrical Reactor and In Situ Vitrification.
Chemical Treatment	Chemical Reduction Oxidation (REDOX).
Waste Containment On-Site	Solidification and Multi-Layered Capping Over Waste Material.
Waste Containment Off-Site	Off-Site RCRA/TSCA Landfill.

It is essential that the site be cleared totally of metal scrap and debris prior to any long term or permanent remediation. This will allow for access to all portions of the site for necessary depth of contamination characterization.

Subsequent to removal of scrap and debris, the surface of the site should be mapped. The mapping should entail surface to ground water isopacks to establish whether the depth of material above the water table. Borings should be initiated on site to establish if any contamination occurs in the soil at depths greater than 5 ft. Positive drainage measures should be provided at the perimeter to prevent erosion from transporting contaminated materials off-site after the debris and scrap are removed.

BIBLIOGRAPHY

U.S. EPA, Reclamation and Redevelopment of Contaminated Land: Vol. 1, U.S. Case Studies, August 1986.

Lindsay, W.L., Chemical Equilibria in Soils, 1979.

ATTACHMENT A

FIELD DATA SHEET

ATTACHMENT B

SAMPLING SOP

SAMPLING SOP

Formulation of a sample plan (number of samples, tentative location and number of duplicate samples);

Generating a standard map to plot sample locations;

Completing all pertinent paperwork as completely as possible prior to collection of a sample, including:

- Field data sheet
- Chain of custody
- Sample tags
- Individual sample containers

Notification of the laboratory (where applicable).

ATTACHMENT C

WELL SAMPLING SOP

WELL SAMPLING SOP

1. Measured the depth to the water table from the top of the steel casing and recorded the depth to the water table minus the height of the steel casing.

2. Calculated the amount of water present in the well by subtracting the depth to water from the total depth of the well and used as "h" in the following formula:

   $$\text{Volume} = (3.14)r^2h$$
   where $r = 0.0833$ ft

   This formula gave the total volume of water contained in the well in cubic ft.

3. The well was then sampled with a bailer that had been decontaminated and sealed at the check valve so as to fill from the top. This sample was for a skim sample only.

4. After collecting the skim sample, three well volumes were evacuated from the well to ensure a representative sample from the ground water.

5. After three well volumes were evacuated from the well, a sample was collected in a HDPE bottle. The sample was then filtered in the field through a 0.45 micron filter to remove any suspended solids. After filtering, the sample was acidified with 5 ml of nitric acid. This sample was analyzed for Priority Pollutant metals.

6. The PCB samples were then collected, with a minimum of 2 liters being collected in amber glass containers.

ATTACHMENT D

SWIPE SAMPLING PROTOCOL

SWIPE SAMPLING PROTOCOL

The swipe sampling utilized the following equipment:

- hexane;
- filter paper (Whatman 42, 9 cm);
- template, 100cm^2;
- collection bottle; and,
- nitrile and latex gloves.

Swipe sampling entailed soaking the filter paper with hexane and applying the filter with constant pressure over the opening of the template, which was in contact with a smooth metal surface.

ATTACHMENT E

AIR MONITORING - QUAP

QUALITY ASSURANCE PROJECT PLAN

AMBIENT AIR MONITORING AROUND SUMMIT EQUIPMENT AND SUPPLY COMPANY AKRON, OHIO

1.0 BACKGROUND AND PROJECT DESCRIPTION

Emergency removal of PCB-contaminated electrical equipment has occurred on the property of the Summit Equipment and Supply Company in Akron, Ohio, between March 10, 1987, and continues as of this writing. Out of concern about local impacts of volatilized or particulate-bound PCB emissions to ambient air around this facility, EPA, through its Technical Assistance Team (TAT, Roy F. Weston, Inc.) is to conduct air monitoring for seven days at five sites near the Summit facility. The exact location of each sampling site is to be determined day by day depending upon local weather conditions and activities occurring within the facility.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITY

Project Manager: Ralph Dollhopf, EPA Region V WMD, EERU

As On-Scene Coordinator, responsible for oversight or remedial activity at the Summit site, preparation of overall assessments of the effectiveness of cleanup, and evaluation of impacts of past and current activities on surrounding environmental features and population.

Field Sampling and Field Quality Assurance: Larry Mencin, Weston
Jerry Klein, Weston

Responsible for collection of environmental samples; developing and implementing a field quality assurance program; shipping samples from the field to the selected analytical laboratory; maintaining sampling and custody records; and preparing reports of field activities and quality assurance for the project manager.

Laboratory Analysis and Laboratory Quality Assurance: Sally Matz, Weston

Responsible for selection of suitable laboratory to conduct analyses according to established procedures and employing appropriate quality assurance checks; delineating conditions for precision, accuracy, blanks recovery efficiency, and other parameters necessary to evaluate data quality; oversight of contractor laboratory performance; and final evaluation of the analytical report provided by the selected contractor laboratory.

3.0 SAMPLE MATERIALS, LABORATORY METHODS, DATA QUALITY ASSURANCE OBJECTIVES

Parameter - PCB

Sample Container - 30-mm glass fiber filter (99.97% efficiency for 0.3 um DOP particles) followed by solid sorbent tube (Florisil, 100 mg/50 mg, separated by polyurethane foam plug).

Number of Samples - Five per sampling day, seven sampling days. In addition, one site per day is to be fitted with a field blank sample (Florisil tube with ends broken but no air drawn through sorbent), and one method blank tube per day will be provided.

Preservative - None; sample to be kept at room temperature during shipment.

Holding Time - 60 days.

Laboratory - To be selected by TAT.

Analytical Method - NIOSH Method 5503 (2/15/84), adapted as described below.

Quality Assurance Objectives - Precision - ± 50% RPD (10-20% duplicate analyses).

Accuracy - 80 to 120% (recovery of internal standards).

Completeness - 90%.

Discussion

The selected analytical method is an adaptation of NIOSH Method 5503. As published, this method does not reach a limit of detection sufficient to compare to an action level in ambient air, selected as 0.001 mg/m^3, which is the NIOSH Permissible Exposure Limit. Therefore, modifications to the method were discussed on April 23, 1987, with John Kaminski of NIOSH staff in Cincinnati, Ohio. Following are recommended conditions of sampling based on that communication:

- Substitution of 13-mm glass fiber filter with 30-mm filter is acceptable; however, adjustment of the volume of hexane recovery solvent will be necessary.
- Sampling flow rate - 1 liter per minute.
- Sampling period - 8 hours; this yields a volume adjusted detection limit of 50 ng/0.48 m^3 ≈ 100 ng/ m^3. This is approximately ten times the action level.

- Two or three blank samples per sample set (sampling day) are recommended.
- All sampling materials used on each sampling day should be from the same lot.
- Laboratory duplicate analyses should be provided at a 10 to 20% level.
- Laboratory spikes of known concentrations of PCB should be analyzed at a 10 to 20% frequency level.
- During sampling, filter cassettes and tubes should be maintained in a vertical position. — filter facing upward.

In summary, the NIOSH method is to be used beyond its published limit of applicability. However, subject to the conditions outlined above, it is expected that the method will be adapted to suit the sensitivity and accuracy needs of this investigation.

4.0 SAMPLING PROCEDURES

Sampling is to be performed consistent with the requirements of NIOSH Method 5503, modified as described above. Ambient air is to be drawn through the sampling assembly by Gilian Model (number) personal sampling pumps at all five sites; the assemblies are to be mounted to correspond with the human breathing zone, or two to three meters above ground.

Prior to sampling, glass fiber filter cassettes will be assembled using a stock of loose filters and cassettes; the filters are to be installed in the cassettes using hexane-reused tweezers. At all five sampling sites, pumps will be operated for eight hours at a flow rate of 1 Lpm. The duplicate site, paired with the site projected to have the highest PCB concentation based upon facility activities and wind direction, will be assembled in similar manner as the active sites, but the pump will not be operated.

Field observations of wind direction will be recorded using a (name) wind monitoring system in place at the command trailer near the entrance of the Summit Equipment facility. Prior to the start of sampling, the wind set will be calibrated for direction and, to the extent possible, wind speed. During sampling, the wind set will be operated with the accompanying chart recorder, which will be accurately labeled according to clock time. At the conclusion of sampling, average wind vectors will be determined using these data.

As each eight-hour sampling period concludes, the filter-tube assemblies will be removed and a post-test flow rate will be recorded, to pair with initial flow rate measurements. Using calibration curves derived for each pump, a total sampled air volume will be calculated. Sampling materials will be removed, clearly labeled according to site identity, and packed for shipment to the analytical laboratory such that the samples are stored as near to room temperature as possible.

5.0 SAMPLE CUSTODY

Environmental samples are to be maintained under custody (security) by the field sampling team at all times from collection through shipment to the laboratory. In the field, this will require frequent surveillance of each sampling site to guard against tampering by outside parties; where applicable, samples will be taken from areas in which the sampling assemblies can be maintained in a secure, locked area.

Shipping of samples will be accomplished using standard EPA custody documents, appropriately completed and signed, and shipping containers are to be secured with suitable locks or breakable seals.

6.0 CALIBRATION PROCEDURES AND FREQUENCY

Each sampling pump will be calibrated before and after each sampling day, and a log of daily calibration curves will be maintained by the field sampling team. The wind set will be calibrated for wind direction and speed before and after the study, or as necessary if apparent damage occurs to the shipment.

In the laboratory, calibration of analytical equipment is to follow the requirements of NIOSH Method 5503, appropriately modified in view of the altered sampling flow rate and time described above. Modification to Method 5503 shall be recommended by the laboratory quality assurance contact, and adopted after consultation with the EPA quality assurance coordinator.

7.0 ANALYTICAL PROCEDURES

The analytical laboratory will adapt NIOSH Method 5503 to the needs of this investigation, in consultation with the EPA quality assurance coordinator.

8.0 DATA REDUCTION, VALIDATION, AND REPORTING

Prior to the start of sampling, a set of data forms will be adopted to record the following:

- Sampling location, date, and time of start and end.
- Overall wind conditions, temperature, barometric pressure.
- Identity of sampling equipment - pump serial number, filter, and glass tube serial number.
- Sampling personnel identity.
- Miscellaneous observations such as unusual activities within the Summit facility.

The analytical laboratory will report each analyzed sample in terms of detected concentration of PCB and detection limit, and all pertinent quality assurance data including internal standard recovery efficiency, results of duplicate analyses, analyses of known spikes, and the like. Each analysis for which the established quality assurance criteria are not met will be clearly labeled by the laboratory.

9.0 INTERNAL QUALITY CONTROL CHECKS

As described above, the laboratory will follow prescribed procedures. Field audits are not anticipated owing to the brevity of the study, the provision of daily sampling pump calibrations, and the level of blank samples.

10.0 PERFORMANCE AND SYSTEM AUDITS

See 9.0 above.

11.0 PREVENTIVE MAINTENANCE

The condition of field sampling equipment will be checked and repaired as necessary before and after each sampling period. The laboratory will follow established preventive maintenance procedures, with deviations cleared through the EPA quality assurance coordinator prior to execution.

12.0 SPECIFIC ROUTINE PROCEDURES TO ASSESS DATA PRECISION, ACCURACY, AND COMPLETENESS

See Sections 3.0 and 8.0.

13.0 CORRECTIVE ACTION

The field and laboratory contacts will be responsible for identifying and communicating needs for corrective action to the project manager. The project manager will then execute the corrective actions in consultation with the EPA quality assurance coordinator.

14.0 QUALITY ASSURANCE REPORTS TO MANAGEMENT

The presentation of quality assurance-related data to the project manager shall be in a form sufficient to enable informed judgments as to the suitability of each data point in this investigation, including the completeness of the entire data set.

POLYCHLOROBIPHENYLS

FORMULA: mixture: $C_{12}H_{10-x}Cl_x$
[where x = 1 to 10]
M.W.: ca. 258 (42% Cl ; $C_{12}H_7Cl_2$)
ca. 326 (54% Cl ; $C_{12}H_5Cl_5$)

METHOD: 5503
ISSUED: 2/15/84

OSHA: 1 mg/m³ (42% Cl);
0.5 mg/m³ (54% Cl)
NIOSH: 0.001 mg/m³ [1,2]
ACGIH: 1 mg/m³ (42% Cl); STEL 2 mg/m³
0.5 mg/m³ (54% Cl); STEL 1 mg/m³
(skin)

PROPERTIES: 42% Cl: BP 325 to 366 °C; MP -19 °C;
d 1.38 g/mL @ 25 °C;
VP 0.01 Pa (8 x 10^{-5} mm Hg;
1 mg/m³) @ 20 °C [3]
54% Cl: BP 365 to 390 °C; MP 10 °C;
d 1.54 g/mL @ 25 °C;
VP 0.0004 Pa (3 x 10^{-6} mm Hg;
0.05 mg/m³) @ 20 °C [3]

SYNONYMS: PCB; CAS #1336-36-3; 1,1'-biphenyl chloro (CAS #27323-18-8); chlorodiphenyl, 42% Cl (Aroclor 1242; CAS #53469-21-9), and 54% Cl (Aroclor 1254; CAS #11097-69-1)

SAMPLING

SAMPLER: FILTER + SOLID SORBENT
(13-mm glass fiber + Florisil,
100 mg/50 mg)

FLOW RATE: 0.05 to 0.2 L/min

VOL-MIN: 1 L @ 0.5 mg/m³
-MAX: 50 L

SHIPMENT: transfer filters to
glass vials after sampling

SAMPLE STABILITY: unknown for filters;
2 months for Florisil
tubes [4]

BLANKS: 2 to 10 field blanks per set

ACCURACY

RANGE STUDIED: not studied

BIAS: none identified

OVERALL PRECISION (s_r): not evaluated

MEASUREMENT

TECHNIQUE: GAS CHROMATOGRAPHY, ECD (^{63}Ni)

ANALYTE: polychlorobiphenyls

DESORPTION: filter + front section, 5 mL hexane;
back section, 2 mL hexane

INJECTION VOLUME: 4 µL with 1-µL backflush

TEMPERATURE-INJECTION: 250 - 300 °C
-DETECTOR: 300 - 325 °C
-COLUMN: 180 °C

CARRIER GAS: N_2, 40 mL/min

COLUMN: glass, 1.8 m x 2 mm ID, 1.5% OV-17/1.95%
QF-1 on 80/100 mesh Chromosorb WHP

CALIBRATION: commercial PCB mixture in hexane

RANGE: 0.4 to 4 µg per sample [5]

ESTIMATED LOD: 0.03 µg per sample [5]

PRECISION (s_r): 0.044 [4]

I assume [illegible] LOD [illegible] 0.0 [illegible] 0.03 µg 0.05 µg = 5

APPLICABILITY: The working range is 0.01 to 10 mg/m³ for a 40-L air sample [4].

INTERFERENCES: Chlorinated pesticides, such as DDT and DDE, may interfere with quantitation of PCB. Sulfur-containing compounds in petroleum products also interfere [6].

OTHER METHODS: This method combines and replaces Methods S120 [7] and P&CAM 244 [4]. Methods S121 [8] and P&CAM 253 [9] for PCB have not been revised.

ATTACHMENT F

QA/QC PLAN

WESTON

QUALITY ASSURANCE/QUALITY CONTROL PLAN

SUMMIT EQUIPMENT AND SUPPLIES
AKRON, OHIO

Roy. F. Weston, Inc.
SPILL PREVENTION & EMERGENCY RESPONSE DIVISION
In association with ICF, Inc., Jacobs Engineering, Inc., & Tetra Tech, Inc.

WESTON

1.0 BACKGROUND AND PROJECT DESCRIPTION

Summit Equipment and Supplies (SES) is a six acre operating iron and scrap metal processing facility located in Akron, Ohio. The facility has been acquiring and reprocessing electrical transformers and capacitors since the late 1960s. As a result of improper handling, storage and disposal of many of the transformers and capacitors the facility has become contaminated with polychlorinated biphenyls (PCBs). On March 10, 1987 the U.S. Environmental Protection Agency (U.S. EPA) began a removal action at SES. An integral part of this removal action was an extensive sampling effort designed to determine the extent-of-contamination both on and off site, and to characterize material for disposal. The Region V Technical Assistance Team (TAT) designed and implemented the sampling program.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITY

Project Manager-Ralph Dollhopf, U.S. EPA
As On-Scene Coordinator (OSC), responsible for oversight of all activity at SES.

Field Sampling and Field Quality Assurance-Larry Mencin, TAT
Jerry Klein, TAT
Responsible for collection of samples; shipment of samples from the field to the selected analytical laboratory; and maintenance of sampling and custody records.

Laboratory Analysis and Laboratory QA-Sally Matz, TAT
Responsible for selection of laboratory to conduct analyses; oversight of laboratory performance and QA; and evalutaion of the analytical report provided by the selected laboratory.

3.0 SAMPLE MATERIALS AND LABORATORY ANALYSIS

Parameter - PCB

Sample Container - Eight ounce pre-cleaned jars with teflon lined lids for all samples.
Swipe samples-Whatman #4, 12.5 cm filter paper
Reagent grade hexane

Preservative - None. Samples to be kept in cool, dark place until delivered to laboratory

Holding Time - Extraction within seven days of collection.

Laboratory - Wadsworth/ALERT Testing, Canton and Cleveland, Ohio

7.0 ANALYTICAL PROCEDURES

Wadsworth was requested to and carried out the requested analysis using EPA-approved protocol for preparation, analysis, storage and preservation of the samples. U.S. EPA Method 8080 was used to analyze the solids and oils while Method 608 was used for water. The laboratory routinely performed all the QA/QC that Wadsworth requires in their QA/QC Statement including blanks, matrix spikes, and matrix spike duplicates. All calculations and QA/QC was verified by the Laboratory QA/QC Coordinator at Wadsworth prior to the report submisssion. The soil samples were analyzed on a dry weight basis and homogenized by the lab prior to analysis. Detection limits were set at 1 ppm barring matrix interference.

8.0 DATA VALIDATION AND REPORTING

Wadsworth reported each analyzed sample in terms of detectable concentration of PCB and detection limits. A summary of QA data was reported and included results of blanks, matrix spikes, matrix spike duplicates and internal standard recovery. Verbal data was reported by Wadsworth within 24 hours of sample receipt to aid in the removal action activities at SES but this data was utilized only with the knowledge that it was verbal data and had not been subject to the final QA/QC review. The analytical reports and QA/QC summary were subject to QA/QC review by the TAT to ensure that the data met all the requirements of the project.

9.0 QUALITY CONTROL CHECKS

As an additional check on the labs QA/QC the TAT included its own QC samples along with the routine samples. The majority of the QC samples were sent into the lab "blind". The QA/QC samples utilized by the TAT included:

Field blank - sample transported to the sampling location and back, carried throught the entire sampling procedure and stored with the samples. Verifies that no contamination was introduced during sampling or storage of samples. Also allows a limited check for lab contaminants. At the time of sampling, a universal soil blank was unavailable so a soil blank was not submitted to the laboratory.

Field Duplicates - a second sample of one location submitted to the lab "blind". Verifies the lab's analytical precision by acting as an external check. Also provides an indication of the variation in sample collcection procedures. Approximately 5-10% of the samples collected were duplicates. Attachment B contains the SES Duplicate Log.

Results of the QC samples indicated that the lab was providing quality analytical data. The samples also gave an indication of the TAT's sampling procedures.

ATTACHMENT A

TAT SAMPLE HANDLING PROTOCOL

ATTACHMENT B

DUPLICATE LOG

WESTON

SUMMIT EQUIPMENT AND SUPPLIES DUPLICATE LOG

87CY04

S-9	ND
S-10	ND
S-15	1260-1
S-16	1260-4
S-39	ND
S-40	ND
S-61	ND
S-62	ND
S-63	ND
S-64	ND
S-78	ND
S-79	ND
S-81	1260-1350
S-82	1260-1180

87CY05

S-3	1260-2
S-4	1260-2
S-21	ND
S-22	ND
S-26	1260-18
S-27	1260-38
S-37	ND
S-38	ND
S-49	1260-2
S-50	ND

87CY06

S-34	ND
S-47	ND
S-88	1260-22
S-89	1260-40
S-92	1260-900
S-93	1260-1800

87CY11

S-3	1260-4
S-4	1260-22
S-9	1260-13
S-10	1260-12
S-12	1260-23/1248-4
S-13	1260-18
S-23	1260-60
S-25	1260-50
S-38	1260-70
S-39	1260-70
S-48	1260-10
S-49	1260-15
S-59	1260-16
S-61	1260-15
S-71	1260-19
S-73	1260-28
S-82	1260-140
S-86	1260-120

WESTON

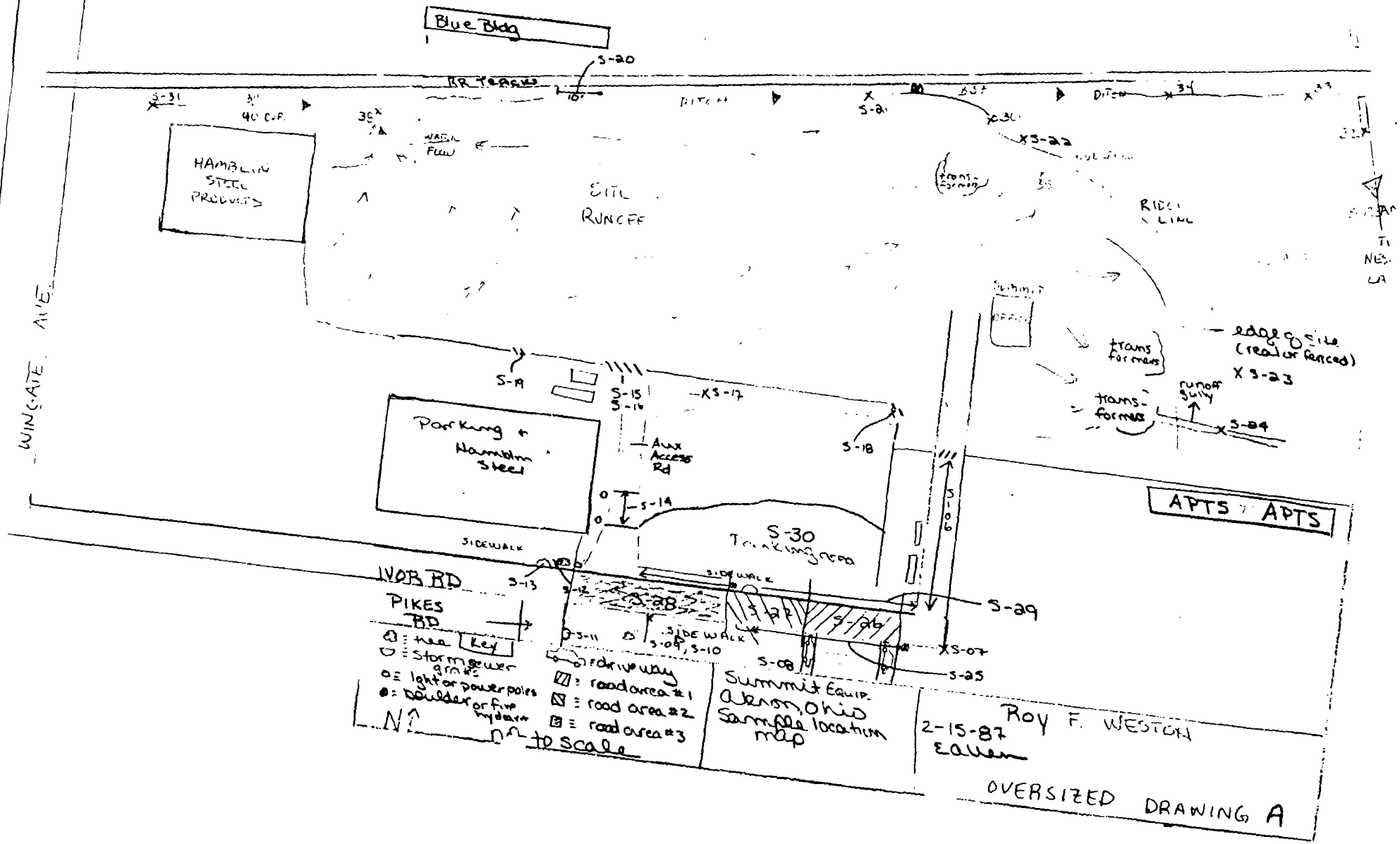
SUMMIT EQUIPMENT AND SUPPLIES DUPLICATE LOG

87CY11

S-93	1260-2
S-96	1260-3
S-99	ND

87CY12

S-1	ND
S-8	ND
S-12	ND



OVERSIZED DRAWING A